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Presented by Mr W. B. Osborn
Oct 1898

Photographic Notes

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Photographic Notes.

JANUARY 1, 1858.

THE concluding number of our last volume contained an account of some new and extraordinary experiments in Photography, by M. Niepce de St. Victor. We commence a new volume on the first day of the New Year, with the important announcement, that a process for Printing Positives direct from the Negative, in unfading CARBON, has been at length discovered. On the 31st of November last, Dr. Phipson deposited with the French Academy of Sciences a sealed packet, containing the particulars of a new process for printing positives direct in carbon.

This is all we know about the matter at present. When the packet is to be opened and the contents published, we cannot say, but shall endeavour to obtain the earliest information, and lay it before our readers. It is not unlikely that bi-chromate of potass, or chromic acid, may be the sensitive agent employed. But we will not indulge in speculations. The process may either turn out to be that great step in Photography for which the Duc de Luynes, a year or two ago, offered the prize of £400; or it may turn out to be a mere photographic curiosity of very little practical value. We must await with patience the opening of a packet, which may possibly contain most important particulars. ~~secret, or a process of no practical value.~~

Some experiments in which we were engaged a few weeks ago, lead us to believe in the possibility of printing in carbon, by the following process:—

First,—Dip a sheet of blotting paper in a mixture of bi-chromate of potass, albumen, and finely-ground charcoal; or blacken it (in the dark), with Indian ink, ground up with a solution of bi-chromate and gelatine, or albumen.

Next,—Dry the blackened paper, and expose it to light, under a negative.

Lastly,—Immerse it in water, which will more or less perfectly remove the black material from those parts where light has *not* acted without disturbing those parts where light has acted, and thereby rendered it insoluble. In this way a print in black and a sort of dirty white may be produced. After which it is probable that immersion in an alkaline solution may clear up the lights sufficiently. This was the direction in which we were experimenting a few weeks ago, when some matters interfered to prevent our carrying the experiments any further.

We have given in the present number an improved formula for Printing by Development; but the article is merely a brief description of the manipulation of the process; we shall have more to say in the next, and following numbers. More than a year has elapsed since we published in this Journal a method of printing without a toning bath. During that time we have made numerous experiments in the process, and executed some large printing orders by it. This experience has enabled us to simplify it a little, as well as to find out its weak points. It is now our intention to discuss this process more fully, and state the results at which we have arrived. We believe it to be at once the simplest and most economical of all known printing processes with silver salts. Mr. Hardwich is now experimenting with this process, and we have occasionally compared notes, and exchanged specimens, with him. He seems at present inclined to think well of it, and says in a postcript to his last letter,—"I have no doubt that prints, formed in the way you propose, are more likely to be permanent, *cæteris paribus*, that any pictures by the ordinary sun-process. This should be distinctly stated."

An interesting communication by Mr. J. T. Brown, an Architect, at Birmingham, has occupied so much of our space, that we must defer to our next some matters which we had prepared for the present number.

We have alluded, on one or two occasions, to some photographs of the Moon, which were exhibited by Mr. Warren De La Rue, at the last meeting of the Astronomical Society. The following account of what took place at the meeting, appeared in the "Athenæum," of Dec. 12th.

"At the close of the Meeting of the Astronomical Society, on November 13th, Mr. Warren De la Rue exhibited a great variety of beautiful photographs of the moon, several of which he placed at the disposal of the Fellows of the Society. He also made some remarks on the application of Photography to recording the appearances of the heavens, and more particularly of those presented by the moon and the larger planets. Mr. Bond, of Cambridge, in the United States, was the first, he believed, who obtained a photographic impression, by means of the telescope, of the lunar surface. At a subsequent period, in the year 1852, Mr. De la Rue applied the collodion, assisted by Mr. Thornthwaite, and obtained an excellent image of the moon; and he had the honour of exhibiting it to the Society, and of describing the apparatus by which he obtained it. It is difficult to follow

the moon's motion in any telescope, without the aid of a clockwork driver; nevertheless, by means of a sliding plate-holder in the place of the ordinary eye-piece, he was able to do so, by viewing the image through the collodion film. The particular form of apparatus employed he had the pleasure of describing at that period to the Society. Mr. De la Rue soon relinquished the pursuit of lunar photography, because it required two enthusiasts; one to uncover the mouth of the telescope, and one to follow the moon's apparent motion; and it was not easy to find a friend always disposed to wait up for hours, night after night, probably without obtaining any result. He therefore resolved to discontinue his photographic experiments till he had applied a clock-motion to his telescope. This he has done during the present year, and he has taken the earliest opportunity of resuming his experiments. The first results Mr. De la Rue obtained were similar to those described in 1852, and were produced by employing collodion and obtaining positive images of the moon. He was very successful from the onset, and had been enabled to distribute a few enlarged copies of a photograph obtained on the 7th of September. There were also copies of it on the table for the use of the members then present. More recently Mr. De la Rue has been induced to make experiments in the production of negative collodion pictures, for two reasons: first, because they admitted of more easy multiplication, and secondly, because the image is much finer in grain. In the positive pictures the precipitation of the silver is in larger particles than in the negatives. The paper copies before the Society were derived from a positive picture, which, in the telescope was obtained in five seconds. When this was procured he was unable to obtain a good negative in less than 14 seconds. However, his friend, Mr. Howlett, lately put him in the way of making negative collodion very sensitive, and he obtained negative impressions in ten seconds. Since this, by paying particular attention to the state of the bath, he had been very successful in still reducing the time of exposure, and had produced pictures, not only of the lunar surface, but also of Jupiter, in from three to seven seconds. The photographs of Jupiter show his belts remarkably well. The beauty of the photographs exhibited of the moon, he thought it would be admitted, gave great promise that at a future period photography will be considered as the only correct means of mapping down the lunar surface. When we shall be able to obtain collodion finer in grain and still more sensitive, it will supersede hand-drawing altogether; and even now the results obtained are much more accurate than anything hitherto done by mapping or hand-drawing. It is nearly impossible, by micrometrical measurement, to lay down all the details of the moon, and much, after a sort of triangulation, has to be filled up by eye. The work is too laborious; and the famous map of Beer & Mudler, wonderfully accurate as it is, does not fulfil the conditions of absolute accuracy in all the minute points of details.

"The Astronomer Royal expressed his feeling that a step of very great importance had been made, of which, either as regards the self-delineation of clusters of stars, nebulæ, and planets, or as regards the self-registration of observations, it is impossible at present to estimate the value.

"The most cordial thanks of Astronomers are due to Mr. Bond, and to the professional amateurs, Messrs. Whipple & Black, by whose perseverance this object has been obtained."—*Athenæum.*

In the Spring of last year we advertised, as about to be published by us, a Dictionary of Terms used in Photography, and also a Treatise on the Negative Collodion Process. In reply to the frequent enquiries which have been made with respect to these promised works, we beg to say that both will probably be ready in the course of the Spring of the present year. The Dictionary has proved a much longer job than we at first anticipated, and the Collodion Process has been delayed until we could conclude some experiments, and think out some little matters we were desirous of introducing, in order to render the work more complete and satisfactory.

Our next number will contain an article in which the question of the large view lens with a diaphram in front, *versus* a small view lens without a diaphram, will be fully discussed, and we trust finally settled. Our diagrams are now in the hands of the engraver.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, Nov. 20th, 1857.

M. Regnault, President of the Society, in the Chair.

Dr. Lorent, of Venice, mentioned some mishaps which had occurred to him in consequence of using gutta-percha vessels. Many waxed-paper negatives which he had developed in gutta-percha trays, were covered with yellow spots.

M. Perrier said he had met with similar annoyances.

M. Ballard stated that there were two distinct kinds of gutta-percha,—one pure and anhydrous,—the other containing various impurities, besides 25 per cent. of water. The use of the latter sort should be carefully avoided in the manufacture of vessels for photographic purposes.

M. Mayland read a note relating to the iodizing of waxed paper. He stated that on a recent tour to the Pyrennees, he had taken with him some sheets of iodized waxed paper, which had been prepared a year before. The negatives taken on this paper were covered with minute spots. He then iodized the papers a second time, and found that the spots disappeared. He stated also that a bath of gallic acid, which had been kept in a gutta-percha bottle, invariably blackened the negatives all over.

[We have used gutta-percha vessels for some years in our own photographic operations, and have never had occasion to find fault with that material.—Ed. P. N.]

M. QUINET brought forward a new process of obtaining negatives on dry collodion. He exhibited at the meeting his method of printing on dry collodion plates, by means of artificial light, and obtained a satisfactory print by an exposure of fifteen seconds to the light of a moderator lamp. The process was stated to be nearly as sensitive as wet collodion, and the simplicity of the development was much admired by all who witnessed the process. On the conclusion of the experiments M. Quinet stated that it was not his intention to publish the formula, as he was going to supply the sensitive plates and developing solution as articles of commerce.

The Society passed a vote of thanks to M. RELANDIN, for an ingenious form of head-rest which he had invented, and which a Committee had examined and approved.

M. REGNAULT read the list of Photographers who had obtained medals, or honourable mention for works exhibited, at the Brussels Exhibition of the year '57.

M. GIRARD (Secretary of the Society), read a a paper on the solubility of the various substances used in Photography.

[We shall give a translation of this interesting paper in an early number.—ED. P. N.]

M. DAVANNE stated that, acting on a happy idea of MM. Bayard and Humbert de Molard, he had employed, with great success, ammoniacal albumen in positive printing.

M. BERTSCH exhibited a most interesting microphotograph of a minute parasitic plant* which, if not the actual cause, is an accompaniment of the disease of the vine. The magnification was 680 times the linear, and 462,400 times the superficial dimension of the object.

[This kind of thing is the really important application of photography to the microscope. We can discover little or no utility in the converse problem of taking a microscopic photograph, as described lately by Mr. Shadbolt and Mr. Hislop. These gentlemen appear to us to be working at the *wrong end of the instrument.*—ED. P. N.]

* Oidium Tuckeri.

ON AN IMPROVED PROCESS OF PRINTING BY DEVELOPMENT, WITHOUT A TONING-BATH.

The reader is probably aware that the problem of printing on plain paper has occupied much of my attention for some years. As a matter of taste, I extremely dislike prints on albumenized paper, and they consequently never find a place in my portfolio. Among the readers of this Journal, there are probaly some who entertain the same feelings, and for them the present article is especially intended. Those who prefer that peculiar kind of vigour and brilliancy, which is exhibited by a piece of black sticking plaster, or a well-polished Wellington boot, to the depth and vigour of the blacks of a fine engraving on plate-paper, need not concern themselves with the process which I am about to describe; for the best results which it appears capable of yielding do not surpass in point of vigour, the best proofs from the press of the copper-plate printer.

All I can say with respect to the process is this ; let the copper-plate or lithographic printer select, in the first place, a paper of the peculiar tint which he thinks most suitable for his purpose, and in the second place, an ink of the most appropriate and beautiful tint. This done, let him exert his utmost skill in producing a fine proof. The result will be—a proof on India paper, either in common printing ink, which is of a cold greenish black tint (very beautiful), or in a fancy ink of some tint lying between a purple brown, and either a green or purple black. Now, I affirm that the Photographic Printing Process about to be described, is capable of yielding positive prints which will bear the most critical comparison, as regards artistic effect, with the best copper-plate or lithographic proof. You may lay the photograph on the finest engraving or lithograph, and find it impossible to say that one is superior to the other in effect; both being equally vigorous and beautiful, and the effects being of the *same kind* in both. But for the peculiar truthfulness and unconventionality of the photograph, it might be mistaken for an engraving. Now, as far as my own taste is concerned, I can conceive of nothing more completely satisfactory than this. The process has also the merits of economy, and the prints are capable of withstanding the action of destructive tests, such as milky hypo, far better than those which are obtained by the common process. I must however admit that the *finest* results are only obtained under certain favourable conditions, with respect to which there is at present some obscurity. I confess I have not completely made out the subject of tints. I cannot yet produce with absolute uniformity the effects I desire. Those who are interested in the process must follow me to the point where I now am, and after that we must compare experiments, and report results. The difficulties which remain, only appear to be such as a little perseverance will surmount; and in conquering them I feel sure that some light will be thrown on other development processes.

The operations are very simple, and the want of uniformity in the results appears to depend mainly on the variable condition of the nitrate bath. Variations in the amount of light, and degree of temperature, affect the result of course to some extent, but I have

obtained some of my best prints in the gloomy month of November, and apparently under the most adverse circumstances of light. My dark room however is always heated to 60° Fahrenheit, at least. I believe it to be impossible to work successfully at a lower temperature than 50°, and a temperature of 70° appears to be about the best.

The process requires no toning bath, and the operations are as follow:—

But first, a word or two on the subject of paper. Any good photographic paper may be employed, but different papers require different treatment. I will first describe the operations on Hollingworth's THIN paper, and then point out the modifications which should be introduced when foreign papers are employed.

The operations differ a little from those described in No. 15 of this Journal. A year has elapsed since I wrote that article, and during that year I have made numerous experiments, and introduced improvements, which not only increase the beauty of the print, but also render the process simpler in the manipulation.

First,—Make the following salting bath:—

Filtered rain water .... 1 ounce.
Common salt.... from 6 to 10 grains.
Lemon juice .... from 1 to 3 drops.

It will be seen bye and bye why I allow this latitude in the proportions. Do not on any account cut the lemon with a steel knife. Stick a pointed piece of wood into it, or bite off a piece of the peel. If you introduce any citrate of iron into the paper, the nitrate bath will turn as black as ink. Use a fresh lemon, and not one that has been opened before, and do not substitute citric acid for lemon juice—it does not appear to me to answer the same purpose; but I may be mistaken.

Observe, there is no gelatine, nor serum, nor any troublesome mess in the salting bath. The bath is nothing but salt and water, with a lemon squeezed into it.

Filter the solution through a fine cambric handkerchief, laid in a glass or gutta-percha funnel, not (block tin), and use it at once. When done with, throw it away, and give the lemon to the cook.

You may either immerse the papers in the bath a great many at a time, or float them on it, one at a time. They should remain *on* the bath for at least two minutes, and if immersed, the time of immersion may vary from five minutes to 24 hours. A rather long immersion seems to give the most vigorous prints, and not to cause the print to sink in the paper and become mealy. Still, as the fine grain of the paper is somewhat injured by long immersion, it would no doubt be a good plan to submit it to pressure, when dry, between glazed mill boards, in an engraver's press.

The papers may be hung up by one corner to dry. I cannot say how long they will keep, for I have invariably used them within a week or two of their preparation.

The next operation is to excite the paper on the nitrate bath, which is made thus:—

Distilled water .... 1 ounce.
Nitrate of Silver....from 20 to 30 grains.
Lemon juice .... 10 minims.

Filter the bath, and float the papers on it, for two or three minutes. Then hang up to dry by one corner. Never dip a pin into the nitrate bath, or it will turn the bath black.

The paper may be excited over night, exposed the next morning, and the picture developed in the evening, (*i.e.* 24 hours after it has been excited).

Expose in the pressure-frame until a faint image of the picture is perceived.

Develop with a solution of gallic acid, freshly made; or, to speak more clearly, add 4 grains of gallic acid to an ounce of *distilled* water; shake up well, and use at once; filtered of course.

The cleanest and best way of developing the picture is to turn up the edges of the paper, and make the print into a tray. Lay it on a sheet of glass truly horizontal, with a piece of clean white blotting paper under the print; then pour a little gallic acid solution on the darkest part of the print, and spread it all over as quickly as possible, with a bent glass rod.

Push the development to the proper stage; then wash the print in clean rain water, and place it immediately in the following hypo bath:—

Clean rain water........20 ounces.
Hypo-sulphite of Soda .. 1 ounce.

Let it remain in this fixing bath for 15 or 20 minutes; then throw the hypo away, and wash the print well in several changes of water, under a tap, and leave it to soak for several hours in a tub, with other prints, changing the water several times. Lastly, hang it up to dry.

The print is now finished.

In consequence of the great length of Mr. Brown's excellent paper, I must defer the remainder of this article to the next number. But, in the meantime the reader will observe the following points:—The development should begin by producing a *fiery-red* picture. If the picture is, in the early stage of its development, of a *dull* red tint, which passes quickly to a brown or black, the finished print will be of that

peculiar olive brown, or black tint, which is so much to be avoided. This evil appears to depend on the improper condition of the nitrate bath.

Having now described the manipulation, I shall, in the next number discuss some of the peculiarities of the process. The most important point I consider to be the substitution of lemon juice for acetic acid in the nitrate bath. The good effects of the lemon juice I discovered by a fortunate accident, or rather a fortunate guess, a few days before Mr. Long read his paper, about this time last year, at a meeting of the Photographic Society. I immediately wrote, and begged of him to mention the great value of the lemon juice, and enclosed some prints taken with it, which he exhibited at the meeting. Since then I have quite given up acetic acid, and have never had a mealy print. It only remains therefore to get the *colour* of the print completely under control, and to ascertain how to avoid or remedy those conditions which give the objectionable olive brown tint.

A few days ago, Mr. Hardwich wrote to me on the subject of Printing by Development. In reply I enclosed him 20 prints which I had taken one morning, about a week before, with the negative from which they had been printed, and an account of the process now described. Yesterday I received a reply from him, a part of which I am sure he will not object to my inserting. It was accompanied by some very nice vigorous prints, taken by a citrate process, which he has described.*

"No doubt you have been expecting to hear from me ere this, about your prints. They arrived safely, and I at once set to work to make some experiments on the process. It appears to me to be a very good one on that particular kind of paper, but not to succeed so well with others. The question therefore becomes, what chance is there that I shall be able to get the same kind of paper, when this present make is exhausted? I am fearful there may be a little difficulty about this, because you say that Hollingworth's *thick* paper is *useless*. I found that by adding citric acid and carbonate of soda to the salting solution, an effect something similar to your prints might be produced; but there is a *danger* of discolouration of the developer, and markings, if the carbonate of soda is at all in excess. I enclose some prints as illustrations.

"Another plan which worked well was to develop up to a red tone, and complete the colouring with sel-d'or. I am inclined to think that each mode ought to be described, in order to ensure success under all conditions of paper. Yours, however, has the merit of simplicity. I may add that I found my process on a foreign paper to give the most sharpness.

"I shall be very glad if you will try my formula, and report upon it in the *Notes*. You understand the theory. Excess of alkali gives rapid development and depth of shadow, more citric acid, a red tone, with feeble shadows."

SALTING SOLUTION.

Chloride ammonium,............	100 grains.
Citric acid,........................	20 "
Bicarb. soda,......................	20 "
Gelatine,............................	20 "
Water,...............................	20 "

Float or immerse the paper for two or three minutes.

"Excite on a 30-grain nitrate bath, with 30 minims of acetic acid to the ounce, leaving on for 3 minutes.

"The view I should take would be this—the more simple the process, the better. Hence, if Hollingworth's paper, simply salted, gives good results, use it, but if there is a difficulty in getting the right sort of paper, then take a foreign quality and introduce citric acid, combined with an alkali, varying the proportions according to the effect desired."

There will be no difficulty in getting a regular supply of Hollingworth's THIN paper, for Messrs. Hollingworth will make it for their Trade customers, to any amount. But other papers will do, by a little modification of the process, which I will briefly describe. Hollingworth's paper contains alum, and has an acid reaction; foreign papers have an alkaline reaction, and the remedy appears to be more lemon juice.

The subject will be resumed in the next number. To perfect a good printing process, which requires no toning-bath, will be a great step in Photography, for certainly the fading of positives has been due, in a great measure, to the use of a toning-bath.

[ED. P. N.]

* I may mention that it was Mr. Hardwich's original citrate process which first gave me the idea of the lemon juice.

ON TAKING INSTANTANEOUS PICTURES.

We have received for insertion the following letter from Mr. Howlett :—

DEAR SUTTON.—I cannot agree with you about the combinations of Chevalier and Lerebours being better adapted for taking instantaneous pictures than those made by Ross. I have always found his lenses *quicker in proportion to the length of focus* than those of any *other maker*. I think with you that it is better (for taking views) to have the posterior lens larger than the anterior. I suppose you did not observe it, but the lens I used in Jersey was made in this way. The diameter of the anterior lens is only $3\frac{1}{4}$ inches, while the posterior has an aperture of 4 inches.

Now a word or two about the bath and collodion for instantaneous views.

To prepare the Bath.—Take Nitrate of Silver in crystal, 800 grains. Distilled water, four ounces. Dissolve. Take Iodide of Potassium, four grains. Distilled water, half-an-ounce. Dissolve. Mix the two solutions, and keep stirring with a glass rod until the precipitate thrown down is entirely re-dissolved. Then add 16 ounces of distilled water. Shake it well and let it stand all night. In the morning filter it. You have now an ordinary 40-grain bath. I now add a few drops of a solution of pure carbonate of soda, until a decided precipitate of carbonate of silver is formed. If the bath is now tested it will be found alkaline. Acetic acid must now be added drop by drop, until it just turns blue litmus paper faintly red. The bath is now ready for use. I find that a bath of this kind will give much better negatives than one made in the common way, and if the acid is carefully added it is quite as sensitive.

I may mention that I have sometimes found a single drop of acid sufficient to render a bath, holding two quarts, neutral.

The collodion with which I have been most successful, is that made by Mr. Thomas. It ought to be iodized twelve hours before use. In this way, using one of Ross's 3-inch lenses, with a stop of 2½-inches between the lenses, and *with a good light*, it will be easy to obtain a sharp picture on a 12 × 10 plate, and it will be almost impossible to expose the plate quickly enough.

Your's truly,

ROBERT HOWLETT.

10, Bedford-place, Kensington, Nov. 26.

—Mr. Howlett has misunderstood us in the matter of the lenses. We did not say that the lenses of Lerebours and Chevalier were *quicker* than those of Ross, but simply that the combinations of those French Opticians, in which the posterior lens is much larger than the anterior lens, give the *flattest field*. Mr. Ross is too good an Optician not to know this, and in the particular lens made for Mr. Howlett, it appears that he has, to some extent, adopted the principle.

Mr. Howlett's letter, which he wishes us to insert, was accompanied by two prints, from instantaneous negatives, of the sea, taken by him in our pretty Bay of St. Brelade. These subjects will probably appear in the next Exhibition of the Photographic Society, and we have a few words to say about them.

When young ladies, (no offence to our fair readers, of whom we have a goodly number), used sometimes to show their pretty sketches to Sir Joshua Reynolds, he had a charming way of patting them on the head, and saying "very nice, very nice indeed." Now we are not going to imitate Sir Joshua, and pat our friend Howlett on the back, and say to his clever photographs, "very nice, very nice." They are far too good and suggestive, and we are too much delighted with them, to bestow on them anything but honest criticism. To see the ripple on the surface of the sea, and the waves running up the sides of rocks and breaking over them, or tumbling in heavy rollers upon the beach, are sights as familiar to us as those of cabs and omnibuses to our London readers. But to see the white blank space which has hitherto stood for the restless sea, in all our photographs of Jersey scenery, replaced by well-defined ripples and breakers, in the photographs of Mr. Howlett, has delighted us more than we can express, and it indicates an advance in sea-scape photography which has put us greatly upon the "qui vive." A few words then about what has really been achieved in these photographs, and what yet remains to be done.

True, the water is no longer a blank white space but the ripples and breakers are not quite crisp enough in their outline. The exposure was not sufficiently instantaneous, and while the human hand had time to remove and replace the cap of the lens the waves had also time to change their form a little; so that their outlines are a *little* blurred and softened. Perhaps a cap with a trigger might have remedied this evil.

Another defect is—the want of detail in the shadows of the rocks. As Mr. Howlett's prints are fine specimens of the popular style of printing on highly albumenized paper, the shadows of his rocks look more like patches of black sticking plaster, than anything else. This might perhaps be remedied by taking two negatives, one for the sea, the other for the rocks, and giving to the latter a much longer exposure; then, printing the sea from one negative and the rocks from another. That this sort of thing may easily be done has been proved by Mr. Rejlander, who has printed one picture from as many as 36 different negatives so successfully that no join can be perceived.

A third defect of these photographs is, that there is a concentration of light in the centre of the picture. This, we are sure, is partly owing to the lenses being mounted in a tube, the interior of which reflects extra-oblique pencils. The posterior and anterior lenses should be mounted in wooden partitions, fitted into the camera at the proper distance apart. No reflected light from extra-oblique pencils could then, by possibility, fall on the plate.

We have an article in preparation on the Chemistry of the Nitrate Bath, and shall therefore say nothing on that subject at present. [ED. P. N.]

ON THE APPLICATION OF PHOTOGRAPHY TO ART AND ART PURPOSES, BUT MORE PARTICULARLY TO ARCHITECTURE.

Paper read by Mr. J. T. Brown, at the last Meeting of the Birmingham Photographic Society.

Before considering the Application of Photography I may not be out of place in tracing generally but concisely the principles of the Art, and although so long ago as 1556 it was noticed by those strange seekers after impossibilities, the Alchemists, that

horn-silver, exposed to the sunbeam, was blackened by it, yet, in their ardent search for the philosophers stone, they overlooked in this phenomenon the germ of those most interesting discoveries which have distinguished the present age, nor until the last few years, has the magnitudinous import of the prime command, "Let there be light," issued by the Great Architect of the Universe, in the conversion by his Omnipotent hand of "the matter unformed and void — darkness profound— into a new created world, earth in her rich attire, the pleasant dwelling-place of men, consummate lovely;" been contemplated, and that great vital principle considered, which called into being, when

Forthwith the Light
Ethereal, first of things, quintessence pure,
Sprung from the deep, and from his native East
To journey through the airy gloom began,
Sphered in a radiant cloud, for yet the sun
Was hot; She in a cloudy tabernacle
Sojourned the while.

and when, by the manifest wisdom of the Creator, who pronounced the light was good, was placed in the centre of our system the celestial luminary, to impart life and energy to every part of his incomprehensible universe; those universal forms of beauty, which, described as God's handwriting— a wayside sacrament, should be by us welcomed as a charmed draught, a cup of blessing.

Certain mysterious agents are perpetually offering astonishing results to the observation of Man, some of which, from their constant presence, become so familiar that they cease to awaken interest in our minds, and of this nature is the existence of the influence called *Light.* While from day to day it fills the sky and overflows the surface of the world, and from night to night, with twinkling points spangles the heavens, or in its soft floods of phosphorescence half dissolves the veil of darkness, yet how few seek to know whence the constant visitant comes, or what its nature is. Important as is its interference with terrestrial affairs, it belongs not to the earth; it is an inhabitant of the infinite, and, free from the fetters that confine denser matter to isolated spheres, floats from the immensely distant sun and yet remoter stars, through the yawning caverns of space, bridging them over with beautiful relations and sympathies. The pulsating stream connecting organized *worlds* with organized *suns*, it makes the universe a living system; without it creation would be a dry skeleton; with it, it becomes a growing, breathing, and palpitating frame.

But what is the wonderful agent which thus widely spreads itself through space? Why does it travel with undiminished speed from one boundary to the other of the vast universe, pass unscathed through the rock of densest crystal, and yet *stop* at the thinnest and palest film of *black* material? Why does it paint the fields with green, the rose with red, and the sky with blue? Why does it move in straight lines and change the direction of its progress when it enters a substance of altered density? and why does it strike the sensitive membranes of the eye with perception? In the resolution of these difficulties the grandest generalisations of science are but approximations, and suggestive rather than satisfying.

In arresting in its bright course from one great luminary, one of these subtle, swift-flying beams, and separating its influences, we shall discover three great powers,—the Illuminating-*Light;* the Calorific or *Heating;* and the Chemical or *Actinic.*

That the glorious orb of day pours upon this earth some principle on which the whole animal and vegetable kingdoms depend for health and life everyone knows. Without the *luminous* agent the surface of this planet would be no longer beautiful, the brilliant hue of the flowers (supposing the plant to have been produced by the *actinic* power alone), and refreshing tints of the trees would be wanting, all would be colourless. *Light* is that part of the solar beam which adorns our world with all its beauties, paints the fair flowers, tints the azure dome above us, and flings the glorious rainbow across it.

On *Heat,* or the Calorific portion of the sunbeam, depends the *life and motion* of this our world. As it were with a magical energy, it produces the disturbance in our atmosphere, known as wind, and causes the waters to flow, vivifies and animates all nature, and then bathes it in refreshing dew; and to judge of the influence of heat on both the animal and vegetable economy, we need only contrast *winter* and *summer*, the one radiant and vocal with life and beauty, the other dark, dreary, and silent.

The third constituent of the sunbeam is *actinism,* its property being to produce chemical effect, and it is to this portion we would now more especially direct our attention. Although its effects have been more studied as yet in the inanimate than the organic creation, still its power is known to be of the utmost importance in the vegetable kingdom. A seed exposed to the *entire* sunbeam will not germinate, but if we bury it in the earth, at a sufficient depth to prevent actinism (which, like heat, penetrates to some distance), but to exclude *light,* a chemical change will take place, which experiments clearly prove is to be attributed to *actinism* and not to *heat.*

The influence of actinism on the animal world is not so well-known, but although probable; that many of the effects hitherto referred to *light,* is in reality due to actinism; it is certain that the animal kingdom are as much dependent upon solar influence as the vegetable, and doubtless more careful investigation will discover this principle to be equally important to the life and health of animals as either of its closely allied powers of light and heat.

Of the actinic influence on inanimate nature, our knowledge is not so scanty, for it is a well established fact, that the sunbeam cannot fall on any body, simple or compound, without producing on its surface a chemical and molecular change; and Niepce discovered that *iodide of platinum,* which readily receives a photographic image, by darkening over the exposed surfaces, speedily loses it by *bleaching* in the *dark,* and hence the singular and striking fact, "*That bodies which have undergone a change of state under the influence of daylight have some latent power by which they can renovate themselves.*" Possibly the hours of night are as necessary to inanimate nature as they are to men and animals, and during the day, an excitement (which we do not heed, unless in a state of disease),

is maintained by the influence of light, and the hours of repose, during which the equilibrium is restored, are most essential to the continuance of *health*.

The immoveable rocks which bound our shores, the mountain which rears above the clouds its lofty head, the Cathedral in all its stately magnificence, the very triumph of Art: and the beautiful statue in bronze or marble, are all acted on distinctively by the sunbeam, and would soon perish beneath its irresistible energy, but for the darkness of night,—the repose of darkness being no less essential to inorganic than it is to animated nature. During its silent hours, the chemical and molecular changes are all undone, and the destruction of the day repaired we know not how.

If, as indeed is probable, all elements are liable to change under solar influence, how great must be the disturbance over the face of our planet when the sun is above the horizon! and how varied the developments of electrical, chemical, and calorific phenomena under this excitation, which, if it is continued, must eventually change the features of this planet and of its inhabitants! And how beautiful that design by which, during external quiescence, matter is enabled to resume its former state, and during apparent rest, to restore to the balance that which it has lost!

Where the sunbeam spreads its genial influence there life in all its myriad forms is to be found; where the sun's rays cannot penetrate "death holds his silent court." At the *surface* of the *ocean* for instance, marine animals, varied in form and beautiful in colour, are found abundantly; as we descend we find the animals gradually sinking in the scale of organization, and below a certain depth, varying probably in different latitudes, no creature stirs the ever-silent sea.

The influences of this power on inorganic matter, are now only being discovered, and the importance and interest of the enquiry will be strikingly evident when we reflect that in the creation of *light* this planet, previously revolving a mighty chaos, became an orb of beauty and animation; and without it, the entire surface would, even now, be an eternal blank.

The various powers of the sun's rays differ with the seasons. In Spring, the actinic is all potent, when dormant seeds are roused to life. In Summer, the illuminating, when soft vegetable tissue is converted into wood by the fixing of carbon, and in Autumn, the calorific, when green fruits are ripened and seeds matured.

But having thus far glanced at the various effects of the solar rays, let us now confine ourselves to the disturbing influence of those several substances which chemistry has discovered to be sensitively alive to actinism, and from which the interesting art of Photography sprung.

It has been shown that a sunbeam, passing over a plate of iron, leaves indications of its path; and in 1813 M. Niepce, on his failure in lithographing on pewter—in his researches for a metallic plate, sensible to the luminous rays, and capable of being impressed thereby with the representation of external objects, solved one of the most complicated and perhaps the most difficult problem of the century in which he lived. Belonging to that class of indefatigable experimentalists who, without much technical knowledge, and with a very slender stock of apparatus, venture into the deepest and most intricate paths of science unwillingly; and ignorant of the fact that when he proposed to himself to create pictures by the chemical action of light he was bringing himself face to face with the gravest difficulties of human science—difficulties that had already baffled the most profound philosophers in the world, and which Sir H. Davy and the patient Wedgewood, after a thousand failures, had declared to be a problem insoluble—he did not frighten himself with any prescribed difficulties, nor conceive that this problem, in appearance so simple, would cost him 20 years of experimentalising, and that death would suspend his labours before he had received the recompense and the legitimate satisfaction to be derived from his experiments.

In 1829 Niepce communicated all the facts relative to his photographic researches to Daguerre, an able painter, and a man of singular ability, who had also embarked in a similar pursuit, unknown to Niepce, and who, once initiated into the secret of his discovery, applied himself without relaxation to its improvement, and five years after the death of the author of this most interesting discovery—who without one ray of fame, and neglected by his co-citizens, departed this life with the sad thought that he had lost 20 years of a laborious career, dissipated his patrimony, and compromised the prospects of his family in the pursuit of a chimera,—fully conceived and developed the Photographic process, which entitled him to the honour of attaching his name to a new science.

To the researches of other eminent labourers in the same field, we are much indebted, but to Mr. Fox Talbot more particularly so. In speaking of his own process in 1839, I find him to have said—"The first kind of objects which I attempted to copy were flowers and leaves, either fresh, or selected from my herbarium. These it renders with the utmost truth and fidelity, exhibiting even the venation of the leaves, the minute hairs which clothed the plant, &c. &c." It is so natural to associate the idea of *labour* with great complexity and elaborate detail of execution, that one is more struck at seeing the thousand florets of an agrostis, depicted with all its capillary branchlets (and so accurately that not one of all this multitude shall want its little bivalve calyx, requiring to be examined through a lens) than one is by the picture of the large and simple leaf of the oak or chesnut. But in truth the difficulty is in both cases the same, the one of these takes no more time to execute than the other; for the object that would take the most skilful artists days or weeks of labour to trace or copy, is effected by the boundless powers of natural chemistry in the space of a few seconds.

I have not time or space to follow further the many and various modifications of the first theory, but perhaps may pay a tribute of respect to the discoverer of the Collodion Process, the late Scott Archer.

I leave to other and more worthy hands the application of Photography to science, but at the same time imagine that Physiology, Geology, Botany and Zoology, Surgery and Astronomy, cannot but be immensely benefitted by its agency.

Before proceeding to its application to *Art* purposes, I may notice that to such perfection has Photography arrived, that astronomers (aided of course, by proper mechanical contrivances) have been enabled to depicture the Moon, and what great results may we not anticipate from general Photographic views of the heavens, and through its medium may probably elicit some information concerning the cause of the difference in the light of some stars from others, and may also determine why every *bright* star does not impress its image on the same sensitive surface with equal intensity.

But to the present object of my Paper.

Bulwer Lytton describes "*Art* as more godlike than *Science*, insomuch as while Science discovers, Art creates."

Art affects national prosperity, intellectual culture, and material and social happiness; *Art* shows us man as he can by no other means be made known; gives us nobler loves and nobler cares, and furnishes objects by the contemplation of which we are taught and exalted; and every department of Art, whether practised by the painter or engraver, sculptor, architect or engineer, must, from its association with Photography, gain rather than lose by the connection.

Although painting and sculpture are the twin sisters of, and dependent in a great measure upon, the more ennobling art of Architecture, yet Photography opens a wide field, and each may take tfom it what he requires, and by taking his own course, not only will Photography be improved, but *Art* will be considerably advanced.

Time will not permit me to take more than a cursory glance at the use which the Artist and sculptor should make of the science of Photography; but am convinced that good must result from the unreserved intercourse between scientific men and artists. It seldom happens that the purely scientific man has much time to bestow upon the subject of Art, nor has the artist, with his ceaseless mental occupation in the composition and execution of his pictures, time to follow out a series of experiments in Photography; yet he can throw much light upon Photography, in an artistic view, while he remains dependant upon his scientific friends to correct lenses and promulgate the shortest and most certain means of obtaining Photographic pictures.

To the artist, the masses of light and shade, their forms, and the proportions which the shade bears to the light and the half tints to both, is more the object of his study than correct definition, and pictures valuable in the eyes of the artist would by the scientific photographer (although delighting him with their broad masses of light and shade, and their truly suggestive character), be pronounced entire failures, and while Photography can reproduce facts in their most complete form, yet there are evanescent effects of light and color, momentary developments of beauty in life and character, which will occupy the whole attention that the artist can give them, and in which no powers of Photography can render any assistance. The mature knowledge of the artist will select specimens, and the camera in a few seconds will present a perfect transcript, the accuracy of which will be so minute as to afford as complete a means of study as if the object itself were continually before the artist; but this correct definition, so important where minute forms and the varieties of texture are required, is not in a general sense absolutely necessary to render Photography *useful* to the artist, who with his camera may plunge into pre-Raphaelism, or Rembrantism, or Reynoldism, and thus watch closely the effects of Nature herself as she kindly sets them down with the pencil of light for the benefit of the student in art; while in the natural studies of breadth of effect to guide the painter in the conduct of light and shade in his picture correct definition would be injurious.

But Photography can never reach the poetry of Nature, and although every variety of subject, from the most solid and substantial to the most light and airy, are displayed with such exactitude of delineation as to completely set at nought the exertions of manual ingenuity, yet all attempts on the part of the artist to sordidly copy such elaboration of detail, destroys the poetry of fine art.

In portraits especially, Photography must render great assistance to the artist, by furnishing him with those elaborate details, which, as in the case of a court-dress or uniform, require making out, and necessarily involve considerable expenditure of time.

Wonderful as are the powers of the camera, we have not yet attained that perfection so as to faithfully represent the effect of *colours*, and consequently of *light and shade*, and valuable as it may be in assisting the private studies of the artist in composition, yet it is by no means calculated to *teach* the *principles* of art. To aim at the attainment of every minute detail is not necessary or desirable, but the endeavour to produce a broad and general effect, in which the *suggestions* which nature offers, will assist his studies materially. Nor until the Art-Student has made himself acquainted with the true principles of his art, and has acquired sufficient power of hand to draw with ease and correctness the outline of any object he may have to represent, would I recommend him to take up the camera as a means of advancement in his profession.

The taste for the higher works of art is only acquired by great and continual cultivation, either by the artist or the public; and those of the old masters more particularly, many of which are but sparingly known out of the country in which they were produced, have hitherto been placed before the student by means of the art of engraving, which was for many years the only ready means of multiplying the conceptions of genius for the use and edification of the million. For want of engraving, the work of the ancients, with the exception of a comparatively few fragments in sculpture, are lost to us; by its aid the sublime creations of the pencils of Angelo, Raphael, and Correggio may, in most of their essential characteristics, be spread over the wide world and handed down to unborn ages long after the originals have perished. To a discriminating eye, an engraved copy of a picture skilfully, conscientiously, and feelingly executed, preserves all the excellent qualities of the painting itself, as design, composition. expression, drawing, &c. Colour alone is wanting, yet though not there as colour, speaking in the same language, it is still there, "translated" into judiciously graduated tints. In this particular, Photography is at fault, for although we may realize, as does the engraving, the

design, composition, and expression, yet unless the picture is painted purposely we cannot realize its *beauties*, solely in consequence of certain colours, such as bright red, yellow and green, which act as *lights* in a picture, always appearing *dark* in a photograph, and blue, on the contrary, presenting a *light* appearance.

But in the reproduction of engravings, our late Exhibition fully proved the competence of the process, and more particularly in the case of valuable old engravings, the plates of which have long ago been destroyed.

Only a few weeks ago, the "Times," in one of its leading articles on the subject of the Manchester Exhibition, just then closed, said,—"The body of the working people, are as yet too undeveloped in taste to come within the scope of the influence of the collection of the best works of the old masters. They must be acted upon by a more *popular* art, by better prints in the shop windows, better cuts in illustrated periodicals, better shaped jugs and cups, better built streets, better designed shop fronts. When they have ceased to live in Paradise Row, to eat off the willow-pattern plate, or to take in illustrated romances in penny numbers, we may introduce them to the great painters, sculptors, and carvers with some hope of success." And "Burke" says,—"Taste is improved exactly as we improve our judgement, by extending our knowledge, by a steady attention to our subject, and by frequent intercourse."

My space will not allow me to enlarge on the lives or works of Ghirlandajo, Donatello, Leonardi-de-Vinci, M. Angelo, of Correggio, Rembrandt and Guido, of Rubens and Vandyke, Claude, Titian, and Murillo, or of those men who have more lately rendered inseparable their names and the art of painting; but I may be allowed a few words on Raphael, with a sincere hope that the artists of the present day of all ranks, may be induced to follow the glorious pattern set by him; who, born not many years ago in Urbino, in early life gained for himself such fame and glory as seldom fall to the lot of man. Courted by the great, and companied by princes, who that their names might be preserved from the obscurity of time, sought to wreath their own in the halo of his immortality. And when at length he prematurely died, and the eyes of Italy were fixed in sorrow on his tomb, his famed survived, and continually growing brighter and larger, has steadily increased with the *world's* growth: and now, though his body has long been at rest, and his fair form has returned unto the dust from whence it came, who shall affirm that Raphael is dead? Is not his spirit even now with us? Is not his fame greater and brighter now than ever? And while the world lasts shall it ever die? Yet this man, this wondrous man, whose name has been a watchword to so many eager and alas! all too devoted followers, did not fruitlessly and foolishly *complain* that to *him* sufficient opportunity was not accorded; for he knew that nothing was so small, but there was in it ample room for *mind;* that greatness of the soul was shewn in finding nothing too trivial for its notice, and that he who cannot rule with wisdom over small things, would assuredly fail yet more miserably if the sphere of his power were enlarged and the weight of his influence increased.

To the sculptor also Photography is valuable, although not to the same extent as to the artist; as the use of plaster of Paris places within his reach, at a small cost, casts of all the best and most perfect models, handed down from antiquity, but where, as in some cases, this is by the present owner denied, Photography steps in and places within his reach a more exact representation, and by the aid of the stereoscope a nearer embodiment of the original, that can be obtained by any amount of manual labour.

As to the use of Photography to the engineer, I need only instance the case of the Suspension Bridge over the Dnieper, at Kieff, constructed by M. Vignoles, for the Emperor of Russia, photographic views of which were taken weekly during the whole period of its construction. In the case of interchange of ideas with foreign employers, each party only partially and imperfectly understanding the other, details of complicated structures may be rendered intelligible, and in the superintendence of distant works, which, by the principal, could only occasionally be visited, Photographic views would be invaluable.

I now proceed to the application of Photography to Architecture.

"That Art which lifts the mighty dome on high;
Points the tall spire towards the kindred sky;
Marshalls the colonnade in long array;
Bends the proud arch across the victor's way;
'Twines the rich tracery in the storied pane;
Spreads the broad transept in the holy fane;
Extends the nave, and vaults the length'ning aisle,
And crowns with mighty towers the noble pile."

And if, in tracing the bearing of Photography on the student, in the study of that art, I occupy more of the time of this Society than would seem to be desirable, I must crave your forbearance, as the religion, manners, and customs of the nations through which we pass, are so embodied, and must necessarily be in all *true* Architecture, that to deduce the true principles involved, we shall have to touch upon each of these topics.

It was well said by Sir C. Wren, that "the pursuit of Architecture was the study of antiquity rather than of fancy, and following that course, must lead you back to the *past*, where—

"Far in her realm withdrawn,
Old Empire's sat in sullenness and gloom.
And glorious ages gone,
Lie deep within the shadow of her womb."

All men of reading desire to possess faithful representations of the monuments of antiquity—the pyramids of Gizeh, the palace of Carnac, or the Cyclopean walls of Greece. We feel a pure and healthful pleasure in examining even the images of scenes made sacred to our memory by the deeds of heroes or the words of sages. The temples of Athens, the wonderful Acropolis, the mysterious ruins of Pæstum, and the fanes and arches of Rome, misnamed the Eternal, speak even from their pictures. There is the still small voice of the past speaking to the present of the mutability of all things. The lesson they thus give us—even those who have never crossed the sea which washes our island home, is but little inferior to that which the traveller receives who contemplates the moral of a broken column or a crumbling arch on the very spots, where once, the glory of the age, they stood. Even in our own land we have temples,

which in their consistent and beautifully elaborate architectural details, realise the poet's fancy of a "*petrified religion.*" We have monastic piles hastening to decay, but even in their dissolution—beautiful; and baronial halls, whose battlemented walls are tangled with ivy and clothed with the moss of centuries. These are hallowed by holy recollections which cling to every British heart, and cannot pass away until we have forgotten the history of our land, or ceased to enjoy the privileges won for us by our forefathers. Each and all of these we are now able to preserve with the strictest fidelity, and impressed by the subtle finger of light upon tablets of metal and glass, or on sheets of paper, every stone will tell its own tale, and as the mind of the poet shines for ever from his productions, so the very genius, the very spirit of the place, will speak to future ages as they now speak to us.

In tracing the history of architecture, we must in reality examine the progress of the various parts of the world towards civilization, and in many cases their relapse into barbarism. All that remains of many once powerful nations are a few ruins, which although isolated and dismantled, yet enable us to form correct ideas of the religion, recreation, manners, and ability of the people by whom they were erected. Ideas expressed in earth and stone by the contemporaries of the Pharaohs, and who have exercised strong influence on society, remain to us almost uninjured. How powerful are the images which they raise! A link in a great chain, they serve by association to re-people the wastes whereon they stand, and call back to the mind, remembrance of the whole course of past events.

The several styles of architecture have uniformly been the *result* of the religion, habits and modes of thought of the nations which produced them, and may be said to be, *the material expression of their wants, faculties and sentiments*, under the influence of climate and of materials at command, and have each undergone a process of gradual decline in proportion to the changes to which each nation in the course of ages has been subject.

The splendid works of Egypt show how wonderfully architecture is there the expression of a symbolic mythology. Religion was the teacher, the priest, the artist. Vast, stupendous, mighty as the system on which it was founded, never has any style of architecture appeared so fully capable of handing down to posterity a complete chronicle of the manners, customs, knowledge and feeling of a people. On the most public portions of these temples, we may still read the complete history of their kings, and the most remarkable events of their most flourishing times. Whilst on their tombs are found delineated a complete record of the arts, science, and commerce, known and practised by this most remarkable people.

Layard, in his researches at Nineveh, has afforded the students in architectural history, fresh links in the chain of enquiry. The discovery of the *arch*, the prevalence of the honeysuckle ornament (adopted by the Greeks, but now here seen in Egypt) the germ of the Ionic order, by the extent of which, Greek art is indebted to Assyria on all points of study.

In Mexico too, discoveries have within a few years been made of ruins not inferior in importance to those of Egypt, and coinciding in some measure with the pyramids and structure of that country, and although no other record is left to us but these ancient monuments of a once powerful people, may we not in a great measure trace their history in the stones. No fewer than 44 cities have been discovered, and the effect on the traveller when he first stumbles over these wonderful monuments of the wilderness, (tenantless ruins, overgrown with enormous trees), long buried and unknown, which, like skeletons wrapped in their burial shrouds, rise from their graves, must be startling and intense, and the first appearance of a cluster of columns in the midst of the rapid vegetation of that climate, equal in magnitude and surpassing in workmanship those of Egypt, miles distant from any habited spot, and of which the natives have neither knowledge nor tradition, may be imagined rather than described.

In Greece, with a new civilization, a new style arose, borrowed in its characteristic features, (as was also their religion) from Egypt; and the religion which in Egypt was spiritual and mystic, became in Greece purely material. The Egyptians in the beginning worshipped *all* Nature, the air, the stars, the sun, the moon, the Creator and His creations, and these they represented by certain forms of men and animals, but long ere their religion had passed to the Greeks they had abandoned the adoration of the thing signified for the grosser idolatry of the objects themselves, so that losing sight of the original allegories they were led to invest their divinities with the supposed attributes of the Heavenly bodies, and hence the religion as derived from Egypt being purely material, impressed a material character on their architecture. The object of Greek art, addressed more exclusively to the intellect and the senses, was the most refined beauty—and feelingly alive to all the bounteous gifts of Nature, they embodied them in their art, without the symbolism, prevalent in Egypt,—and conceiving God in the image of man they made men like Gods.

But under the Romans, Greek art became still more material, and lost the refinement which with the Greeks redeemed it. Having attained an almost boundless power over the then known earth, the Romans neglected the traditional deities of their forefathers and set themselves up as Gods.—Glory, conquest and luxury was their real religion or bond of union, the monuments handed down to us as the true chronicles of their times,—the Coliseum, the baths, theatres and triumphal arches, and it is for these only they claim any originality of invention. *Greatness* and richness, though two of the principal elements of architectural effect, are not the only ones, and although many of the Roman edifices add to those qualities *appropriateness*, even that will not suffice. Concealed construction, the junction of incongruous styles and ornaments, and the juxtaposition of inappropriate parts; copying and borrowing blindfold instead of inventing, in short, a want of artistic feeling and understanding of the subject characterise and spoil all the architectural efforts of the Romans.

Close following the fall of paganism, and with the rise of the christian religion, a new era in art arose, than which, when science, religion and love, under the influence of faith ministered to it, no style has been more glorious or more beautiful. If we carefully analyze christian architecture, we shall find in it the requirements of the age and country to which we direct our attention. Whether we look at the Gothic of Northern Italy, Lombardic or Venetian, with all its picturesque effect of light and shade, of Spain or Germany, or our nearer neigbour and now ally, France; or in our own much loved land, we shall find the tendency in all the same, the elevation of the heart and mind, through the medium of pillar and arch, pinnacle and spire, gradually and by degrees, leading our thoughts from earth and worldly matters to those more immediately connected with the soul. Those beauteous structures which—

> Children, that come to see these saints in stone,
> As day by day out of the blocks they rose,
> Grew old and died, and still the work went on,
> And on, and on, and is not yet completed;
> The generation that succeeds our own
> Perhaps may finish it. The architect
> Built his great heart into these sculptured stones,
> And with him toiled his children, and their lives
> Were builded with his own into the walls
> As offerings unto God.

And among these I may justly call attention to the Cathedrals of Wells, with its wondrous west front and glorious display of sculpture; Winchester, a perfect history of architecture; Lincoln, with an accumulation of beauties nowhere rivalled; Lichfield, with its three spires; Westminster, the resting place of Kings and of early arts the record; of Salisbury, the most uniform of all, and a perfect whole—or those glorious abbeys, many of which, like Tintern, in its delicious vale, cunningly placed; reft of their thousand beauties, stand as relics of the mighty age in which they were erected; or the village church, whose spire, the perfection of the elements of design, shoots up into the sky. In this country, the culminating point of gothic was reached, and all its crowning elegancies achieved in the decorated period—when, saints sanctified in stone, took their place beneath sculptured canopies, and floriated pinnacles, and running foliage curiously cut, grew up into the hollows of mouldings. The possession of these noble piles, the combined results of the piety, liberality, genius, skill and taste of ages gone by, entails upon succeeding generations a serious responsibility in scrupulously preserving them from injury, and handing down intact and unimpaired their beauties to generations yet to come.

The religion of Mohammed produced an art in unison with its imaginative and poetic doctrines, an art as essentially the offspring of the Koran as gothic that of the Bible, and the palaces of Granada and mosques of India and Cairo, shew everywhere the calm, voluptuous translation of that doctrine. The Mahommedans, forbidden by their creed to represent *nature* in any of her multitudinous forms, and more particularly the human form divine, were led to adorn their temples in a style peculiar to themselves. Expressing faith while adding beauty—inscriptions from the Koran were interwoven with geometrical ornaments and flowers, and the offspring of this art, the Alhambra, or red castle, the celebrated palace of the ancient Moorish kings of Granada—combines in its architecture every element required in a true style of art.

With the exception of the Chinese (whose peculiar architecture is little known and less appreciated) the Mahommedans are the only race who still practise the art which grew up with their civilization, and although that art evidently suffers when brought in contact with European influences, as in Turkey and parts of India, they are still faithful to the *art*, as to the religion, habits and modes of thought which inspired it.

I need not refer to any of the other styles of art which have existed, but all have with more or less of faith been inspired by spiritual or political ties.

In the application of Photography to architectural purposes, correct definition, which to the artist is unnecessary, is to the architect of first importance, and regardless of any other consideration, every effort should be exerted to get the detail as sharp and clear as possible—though for producing picturesque effect, a different treatment is required.

In the study of architecture, there are three great constituents of that divine Eurythmia, which awakens in the mind the perception and joy of beauty. Fitness of parts, harmony of ideas, and unity of purpose.

Beauty is the true aim of art, and not of high art alone, but of everything that appeals to the taste; nor can we with impunity fall away from beauty, to offer up our ingenuity and skill on the altars of the strange gods of our ancestors. *Virtue, order, happiness*, depend in a great measure upon taste. The hills, the glens, the woods, the waters, the birds, the flowers—all things that God has clothed with beauty, possess a medicative power to heal the soul and invigorate the affections. But the enjoyment of the works of nature will be of little use, if their impression is to be instantly effaced by the *artificial objects* that surround us, and each one of these objects therefore, even the most minute and insignificant, ought to be constructed on the same principal of harmony which plans a temple or glorifies the Heavens.

It will be found that there are principles conveyed to us through the natural kingdom, which man has endeavoured to apply to all he undertakes, and certain it is that in Architecture and its concomitant arts, he has followed the working of nature to a great extent;—our Shakespeare in his "Winter's Tale," says—

> That Art
> Which you say adds to Nature, is an Art
> That Nature makes.

And the same source, which is inexhaustible, is equally open to us as it has been from time immemorial to the artists of every clime, who from thence have derived forms of grace and elegance.

A beautiful building resembles a great epic poem, in which all the parts are so justly balanced, and so nicely harmonized that the effect produced on the mind, is that of beauty and repose.

If we examine the works of the middle age Architects, we shall find they did not work without rules, or guiding principles, and the more fully we study our ancient edifices the more clearly does it

become apparent that nothing was introduced unnecessarily or deceptively for mere appearance sake: that the excellence of effect which is apparent, resulted from the use of sound principles, laid down not with a view of producing that effect, but with reference to *stability, convenience and fitness*, good taste and great skill being afterwards employed in adorning that which was necessary, and making the useful a producer of the beautiful.

For the true test and foundation of all pure ornament—Geometry—the Architect is indebted to Nature. Art combinations would, without the aid of that science, cease to be graceful, and their symmetrical combinations would no longer exist. So long as ornamentation is disposed as designed upon natural laws, so long will it be beautiful and endurable, for "a thing of beauty is a joy for ever;" but if, on the contrary, unnatural outlines and fantastic shapes be fostered, the growth of the spreading boughs, the budding of the clustered foliage, will be arrested, and an unhealthy formality mistaken for beauty.

The principles to be followed in imitating nature, are those which she herself adopts in the organization or arrangements of her works; no abortions, imperfections, or peculiarities, ought to be copied; but the Architect's object should be, not to make things as *Nature makes them*, but as she *would make them*. PERFECT foliage, flowers, and vegetable forms, must be distributed and applied in strict accordance with Nature's rules. The idea of perpetuating, in stone, the beauties of the vegetable kingdom, emblematically expressed, was a happy one of the greatest antiquity, and there is no style of architecture without its *flora* more or less conventionalized. So extensive is the range of art decoration in every civilized country, each of which possesses its own characteristic development, that to collect, analyze, and study comprehensively the resources of so widely cultivated a field, would occupy a lifetime. The architect requires a greater knowledge of *living* plants than of *dead* ones, leaves and flowers are of little use after they have been flattened, as the undulations and the beauty of the forms are lost. The form of the leaf, the disposition of the veins, the position of the leaves upon the stem, the form and character of the stem, the flowers and the fruit, are all of moment, and require to be carefully studied.

In this study of ornament it is that the architectural student will discover the benefits arising from the use of the camera, in assisting him in the consideration and adaptation of all those varied combinations required in ornament, which, as "Ruskin," in his "Lamp of Beauty" says, "must consist of such studious arrangements of form as are imitative or suggestive of those which are commonest among natural existences, that being, of course, the noblest ornament which represents the highest orders of existence. Imitated flowers are nobler than imitated stones, imitated animals than flowers, imitated human form of all animals the noblest. But *all* are combined in the richest ornamental work, and the rock, the fountain, the flowing river with its pebbled bed, the sea, the clouds of Heaven, the bird, the beast, the man and the angel, mingle their fair forms on the bronze of Ghiberli." But if the student, after a patient contemplation of Nature and Art, should not be enabled to put into *execution* the qualities necessary in the production of great architectural works, by their study and observation, he would at least enhance the happiness of his existence.

Let the architectural student look back to days long gone by, at the Monk architect at work in his narrow cell, and study to emulate him,—see his pale cheek glow with delight as he built up in his mind the edifice which he was studying, his thoughts are not merely to copy but to surpass all his predecessors, and so he judged every separate stone, allowing none to keep their place without rendering some worthy reason, and when he had given to his shades their utmost intensity and his lights the fullest grace which they could attain, feeling the correctness of his main lines, and that therein nothing further could be achieved, yet when he came to clothe his building with the last robe of loveliness of which it was capable, then still more unrestrainedly did he seek for inspiration from the teachings of Nature, and by entwining

(To be concluded in our next.)

☞ *We have again to defer the insertion of numerous letters from Correspondents on account of the eloquent and interesting article of Mr. J. T. Brown having extended over the space which we usually devote to Correspondence.*

Photographic Notes.

JANUARY 15, 1858.

We have some interesting novelties in photographic processes to describe in the present number.

M. Quinet has exhibited the manipulation of a new dry negative process on glass, in which the sensitive film is perfectly transparent, and the mode of development rather peculiar.

M. Leborgne has discovered some advantages which appear to result from the addition of a salt of lead to the nitrate bath.

M. Alexis Gaudin has described a process by means of which collodion negatives may be taken instantaneously, and developed to a sufficient intensity, either by means of a proto-salt of iron, or a solution of gallic acid. Like M. Leborgne, he obtains his results by the addition of a salt of lead to the nitrate bath.

Mr. Berry, of Liverpool, has obtained some curious and promising results by the use of casein as a medium for supporting the sensitive iodide of silver on a glass plate.

M. Davanne has described some advantages which appear to arise from the addition of ammonia to the albumen used in positive printing.

Mr. T. Bullock, of Macclesfield, has favoured us with an account of his process of taking collodion positives direct on card; and Mr. Beattie, of Leicester, has kindly shewn us how to solve a difficulty, proposed for solution a few weeks back by Sir Denham Norreys, which consists in transferring collodion positives from glass to glazed leather.

Lastly;—Our correspondent, the Patent Agent, has sent us a copy of the Specification of a Process, by Mr. McCraw, of Edinburgh, for taking positives direct in the Camera, on *a white* ground; by means of *reversing the action of light.*

A few words then on each of these interesting topics, taken in the order in which we have announced them.

The new dry negative process of M. Quinet is unfortunately a secret, for that gentleman intends to try and turn his process to account by offering prepared plates and developing solutions for sale. This he has of course a perfect right to do, if he chooses. M. Quinet is the inventor and patentee of a modified form of stereoscope, or stereoscopic camera, to which he has given the name of "Quinetoscope," (an instrument which Sir David Brewster has funnily observed would seem to be intended for offering some peculiar facilities for viewing M. Quinet). A few days ago, M. Quinet, who appears very anxious to exhibit the manipulation of his process, called on the Editor of "La Lumière, (M. Lacan), with his Quinetoscope and a box of dry sensitive plates, some of which had been excited eight days, and others two days previously. The plates were exposed, in a garden, at about two o'clock in the afternoon, the weather being very cold and foggy. The time of exposure was from 30 to 35 seconds. The sensitive plates were transparent; there was no opaque film of iodide of silver upon them. The plates were first moistened, and the pictures developed by means of three different fluids poured alternately on the plate. The results were successful, and the negatives very sharp and vigorous. The process is stated by M. Lacan to possess two peculiarities. One is, that the older the plate the more sensitive it becomes, and the more rapid the development;—the other—that the development may be stopped at any moment, and continued even after an interval of many days.

It appears therefore, that the process of M. Quinet possesses some marked peculiarities, and we confess we are curious to understand the chemical mysteries of the transparent film, and the peculiar mode of development, which is said to be wonderfully simple, and under the complete control of the operator. With respect to the capabilities of the process, they appear to have been sufficiently demonstrated, both at the last Meeting of the French Photographic Society (see *Notes*, No. 42), and in the presence of M. Lacan; but we are amused at observing, that since a secret was made of the chemistry of the process, the French Society was not to be made a cat's-paw of by M. Quinet, and no mention is made of his experiments in the Report of the Meeting, which appeared in the last No. of the Bulletin of the Society. The liberal conduct of Dr. Hill Norris with respect to his process, (with which we are becoming more delighted every day), certainly contrasts favourably with the policy of M. Quinet.

The process of M. Leborgne consists in increasing the sensitiveness of a collodionized plate by adding a salt of lead to the nitrate bath. The particulars are as follow:—

Dissolve, in one vessel, 20 grammes of acetate of silver in 100 grammes of distilled

water; and in another vessel, 16 grammes of nitrate of lead in 100 grammes of distilled water.*

Mix the two solutions, and use the bath in the ordinary way. Any of the salts of lead may be employed, but the nitrate gives the best results.

The picture is to be developed by a solution composed of gallic acid 1 part, water 1000 parts; and fixed in the ordinary way.

The advantages of the process are stated to be,—1st, increased sensitiveness;—2nd, the bath may be charged to saturation without giving any precipitate;—3rd, the bath never becomes acid;—4th, the sensitive plates may be preserved a long time without losing their properties, and may be used in the dry state; —5th, it is not necessary to develop the image immediately on removal from the camera.

M. Leborgne states that this bath may be used with equal success in positive printing.

We now come to the process of M. Gaudin for obtaining instantaneous negatives, which may be developed to a sufficient intensity by a proto-salt of iron, or a solution of gallic acid. We may observe, *en passant*, that the finest stereoscopic subjects we have seen are those by Mr. Wilson, of Aberdeen, who, we are informed, generally employs an iron salt as a developer, and has lately succeeded in obtaining instantaneous negatives of large size, developed in this way. We should be very glad to learn the particulars of his process, for certainly his works exhibit extraordinary beauty of half-tone. But to return to M. Gaudin.

His process consists in first making a nitrate bath according to the following formula:—

Add to a solution, containing 10 per cent. of nitrate of silver, a small quantity of reduced metallic lead, in a finely-divided state, and also a small quantity of nitrate of lead; the proportions are not stated, being perhaps, at present, somewhat uncertain. Boil the solution. The heat will precipitate a portion of the silver, and the liquid will become black. Sub-salts of lead and silver will be produced, and after a quarter of an hour's boiling, the bath may be filtered, and is then ready for use.

When gallic acid is to be used as a developer, a few drops of acetic acid must be added to the plombiferous silver bath; but when the iron salts are to be used, a much larger quantity of acetic acid must be added.

The solution of gallic acid must be saturated and carefully filtered, and a few drops of nitrate of silver must be added to it in the measure, immediately before use. The negatives come out quickly, and are of a brownish tint, yielding very good prints.

With the proto-sulphate of iron, the bath is said to give very intense and perfect negatives, after an extremely short exposure. We imagine this to be the chief merit of the process. It is a well-known fact, that the addition of a small quantity of acetate of lead to a solution of gallic acid increases the density of the negative. The action of the salts of lead in assisting development deserves to be carefully studied. We must not forget also that iodide of lead is sensitive to light.

Mr. Berry's process consists in employing casein instead of collodion, or albumen, as a means of supporting the sensitive film of iodide of silver on a glass plate. He has kindly sent us the account of his experiments through the medium of the Secretary of the Liverpool Photographic Society, who informs us that the Paper was read by Mr. Berry at the last meeting of that Society.

We have inserted this interesting communication at page 25. Casein is a substance closely resembling albumen in its properties. It is held in solution by the alkali contained in milk, and is coagulated by the addition of certain acids. Mr. Berry has taken advantage of the solubility of casein in an alkali to spread it on a glass plate; it is afterwards coagulated by heat, and the nitrate bath, and in this way a film is obtained which adheres to the glass and contains the photogenic materials. The process is at present one of those curiosities in photography which we are always happy to hear of, and insert, for they not only prove the ingenuity of experimenters, but afford hints which may be successfully followed up in some way or other.

M. Davanne read a paper at the last meeting of the French Photographic Society, in which he stated that he had discovered some advantages in adding ammonia to the albumen salting bath, used for positive printing. We have given a translation of this paper at page 25. Albumen, like casein, is soluble in an alkali, and coagulated by the addition of certain acids. It appears therefore, that by adding ammonia to the albumen bath, it is rendered more fluid, and the albumenized paper less liable to dry in streaks; while the ammonia, being volatile,

* We are inclined to think there are mistakes in this formula. Acetate of silver is nearly insoluble in cold water. Perhaps "acetate d'argent" is a misprint for "azotate d'argent," nitrate of silver. And again, 16 grammes of nitrate of lead could scarcely be dissolved in 100 grammes of cold distilled water; while hot water would be likely to decompose this salt.—Ed. P. N.

escapes from the paper when drying. We are inclined to think this suggestion of M. Davanne's a very good one; but at the same time it seems quite possible that *some* ammonia might be retained by the albumen, and that this might occasion the discoloration of the paper after being excited on the nitrate bath. Should anything of this kind occur, a good remedy would probably be, to add some lemon juice or citric acid to the nitrate bath, particularly as lemon juice always appears to increase the surface vigour of a print.

We mentioned in our last number that Mr. Bullock, of Macclesfield, had kindly sent us a very pretty positive collodion portrait, taken on the back of his address card. He has since furnished us with the particulars of his process. We are not at liberty, however, to publish them, as they may be learnt on the terms stated in his advertisement, but he has left it to our discretion to say just so much as may whet the curiosity of our readers with respect to an ingenious and simple process, which it is worth anyone's while to know. The facts stated in his advertisement are strictly correct. The picture is actually taken in the camera on the card, which is from first to last the vehicle for supporting the photogenic surface. No transferring is required. The card is actually coated with black varnish and collodion, dipped in the nitrate bath, &c.; the face of it being of course protected during the operations in a very ingenious way.

In No. 34 of this Journal we solicited information on the subject of taking collodion positives on glazed leather. We are now able to inform our readers how this may be done, in two different ways. For the first method we are indebted to the kindness of Mr. Beattie, of Leicester. He describes it as follows:—

"Take the portrait on glass as usual; then cut the collodion film to the required shape. Choose a piece of smooth leather. Moisten with spirits of wine both the leather and portrait. Press the one on the other very carefully. Let dry. Then the portrait will come off the glass beautifully. I send you one, made for amusement only. You cannot scratch the film."

This specimen is quite satisfactory. No one could possibly discover any edge to the collodion film. The portrait is oval, and there is a margin of glazed leather all round it, giving the transfer a mat-like appearance. This specimen exactly resembles that forwarded to us by Sir Denham Norreys, and alluded to in No. 34. Mr. Beattie's mode of transferring is infinitely better than that which we suggested.

The other method of taking positives on glazed leather, cloth, &c., requires no transferring. The collodion is poured at once on the glazed material, and the film may be either excited by floatation on a nitrate bath, or by immersion, the glazed leather or cloth being in that case stuck to a piece of glass in such a way that the nitrate bath cannot get to the back of it. This is one part of Mr. Bullock's ingenious process. Glazed canvass may be obtained from Messrs. Ellington & Ridley, 89, Watling Street, London, at about three shillings per square yard.

With respect to Mr. McCraw's process:—The patent, applied for in July last, has not been completed, so the particulars mentioned in his Specification are now, we believe, public property. But his process is not new, since attention has been called to the fact of a positive having been produced by the reversed action of light, both in this Journal some months since, and also at a recent meeting of the Photographic Society. Nevertheless, we had no idea that this process was capable of yielding results sufficiently good to make it worth anyone's while to take out a patent for it. It seems likely that Mr. McCraw's processes may be turned to useful account by professional portraitists. We advise our readers by all means to experiment with them.

We promised to discuss in the present Number the question of large view lenses with a stop in front, *versus* small view lenses without a stop.

The reader will find, on referring to p. 97 of the Photographic Journal for December, 1854, an article by us on this subject; and in the number of that Journal for April, 1855, another article, in which we stated a curious fact connected with the plano-convex lens. Now it happens, that in investigating the optical principles of the camera obscura, the lateral pencils are found to have such great obliquity that the attempt to apply ordinary optical formulæ to this problem leads to an erroneous result. The problem of determining the maximum flatness of field of the image formed in a camera obscura requires to be treated in a peculiar way. We must in this instance make a fresh start in optics, assuming nothing but the simple law of refraction, and the geometrical properties of the circle.

Proceeding in this way in the mathematics of a subject which, so far as we know, has never yet been discussed in any optical treatise, we have commenced with the simplest case, viz:—that of the single plano-convex lens,—and have thence conducted our enquiries through the whole subject, so far as the achromatic view-lens is concerned.

The results which we have obtained are very curious and important. But it is not possible, in a Journal of this kind, to give complete demonstrations of complicated questions in Optics, involving large and costly diagrams. We must content ourselves with simply stating the facts proved, and in one or two instances only introducing a mathematical demonstration.

In discussing the case of the single plano-convex lens, we discovered at once that the large lens, with a stop in front, gives a flatter field than a small central portion of the lens without a stop. From the demonstration by which this fact is established, it appears, that when a large plano-convex lens is presented with its plane side to extremely distant objects, the image is formed on a spherical surface, which is concentric with the convex surface of the lens, the radius of the field being equal to the focus of the lens, plus the radius of its convex surface.

As this fact stands at the very threshold of the enquiry, and as no one can conduct the enquiry in a scientific manner without at once stumbling upon it, we are much amused at finding that Mr. Grubb has taken particular pains to deny it. In his last communication, read at a Meeting of the Photographic Society on the 3rd ultimo, he says,—

"As a postscript, and lest silence should be construed into assent, I desire to state that I have not found the radius of curvature of a field given by a plano-convex lens, plane side next parallel rays, to be equal to the focus plus radius of the convex side, as Mr. Sutton said I should."

A day or two since, we received a letter from the Astronomer Royal, in which he makes the following remarks on this subject, which may be considered as conclusive:—

"The theorem of which you speak, relating to the images formed by parallel rays falling on the plane side of a convex lens, is perfectly correct, and (as you remark) is not to be found in any Treatise on Optics, at least any with which I am acquainted. But I suppose that people have invented it, and re-invented it, when they wanted it. You will find it in a Paper of mine, printed about 30 years ago in the Cambridge Transactions, entitled 'On the Spherical Aberration of Eye-Pieces.' I have there given it as an instance of the application of a general formula, remarking, at the same time, that the geometrical demonstration is simple."

The theorem is therefore admitted by Professor Airy, and has been demonstrated by him in the Paper referred to. Mr. Grubb's experimental and mechanical mode of dealing with optical problems has therefore failed in this instance.

Now this remarkable theorem is approximately true in the case of the common achromatic view-lens, as we stated two years and a half ago, at the bottom of p. 153 of the Photographic Journal for April, 1855. That is to say: the image formed by an ordinary achromatic view-lens, with a stop in front, when presented to extremely distant objects, lies (approximately) on a spherical surface, which is concentric with the posterior convex surface of the lens; while the image formed by the small central part of the same lens, without a stop, lies approximately on a spherical surface the centre of which is the point where the axis of the lens meets its posterior convex surface.

Here then is the complete solution of the question of the large view-lens with a stop in front, *versus* the small view-lens without a stop; for whatever the shape of the lens may be, it can be proved, that in the former case, the radius of the field is longer than in the latter, and the field consequently flatter.

But this fact could never have been established by square and compasses, or by an appeal to experiment. *Geometrical* truths can only be established by *mathematical* reasoning.

We shall return to this subject on a future occasion, when a diagram will be introduced, and a demonstration given of the fundamental proposition which we have stated with respect to the plano-convex lens.

We cannot at present offer any opinion on the subject of M. Petzval's new lens. Our impression is, that it may very probably turn out to be an improvement on the present construction of portrait lenses, but that its excellencies may have been somewhat exaggerated. The fact of the posterior lens having a plane surface appears to us to be greatly in favour of the theory advanced.

Our readers will no doubt be glad to hear that we are making arrangements with one of the first Photographic firms in New York, for

introducing this Journal into America. We hope thereby to increase considerably its circulation and usefulness.

We have also the gratifying news to tell that the number of our subscribers among the Photographic Societies in India has greatly increased within the last month.

We hear with some regret that the Liverpool Photographic Society has lately become amalgamated with the Historic Society of that town, thereby losing its independent existence as a society. We have many kind friends among the Photographers of Liverpool, and we need hardly remind them that our columns are always at their service for the insertion of articles of interest, particularly relating to that branch of Photography in which they so much excel, viz., collodion positives.

The continuation of our article on Printing by Development must be deferred to the next number.

We have received the Report of the meeting of the Birmingham Photographic Society, on the 29th ult., when an interesting paper was read by the Hon. Secretary, Mr. C. L. Haines, "On the rise and progress of Photography." This paper, and the proceedings at the meeting, will be inserted in our next number.

Messrs. Horne and Thornthwaite have lately patented a new pneumatic plate-holder, which we can confidently recommend, as being, in our opinion, the best and simplest yet introduced. It can be forwarded by post, and we advise our readers to lose no time in procuring one, for it certainly answers admirably. It is, in fact, the perfection of a plate-holder. The india-rubber ball, which by its expansion exhausts the air from beneath the plate, seems made on purpose for a handle, and it appears hardly possible for the instrument to get out of order.

We have received for insertion a very interesting letter from the Rev. T. M. Raven, describing the particulars of a recent Photographic tour from Jersey to the Pyrennees. The process he employed was waxed paper, and we can say, with perfect sincerity, that some waxed-paper negatives, taken by him of scenery in our neighbourhood, during his visit to this Island in the month of August last, are quite equal, if not superior, to anything we have seen by that process. This communication will appear in our next.

We hear with some surprise that the Scottish Photographic Society have refused to admit into their Exhibition Mr. Rejlander's picture of the "The two ways of Life;"—a subject intended to teach a high moral lesson, and which is certainly the cleverest photograph that has yet been produced. We sincerely hope no such prudery will find its way south of the Tweed.

SPECIFICATION

OF MR. MCCRAW'S PROCESS FOR TAKING POSITIVES DIRECT IN THE CAMERA, ON A WHITE GROUND, BY THE REVERSED ACTION OF LIGHT.

No. 1843.—WILLIAM MCCRAW OF EDINBURGH, *Artist*, *for* "Improvements in the production of Photographic Pictures." *2nd July*, 1857.—Not completed.

This invention relates to certain improved processes for producing positive photographic images, or pictures, on white, or light-tinted substances, either vitreous, animal, or vegetable. A slab of porcelain, by preference unglazed, is coated with collodion or other suitable medium. It is excited in the nitrate of silver bath, and exposed in the ordinary manner. It is taken into the dark room, and the prepared surface is saturated with weak proto-sulphate of iron, or pyrogallic acid, or other developer, which is immediately washed off before any appreciable effect is produced. It is then momentarily exposed to subdued daylight, or to an artificial light, and immediately treated secondarily with a developing fluid, when the latent image appears as a positive, with the lights and shadows correct. It is however left-handed. To obviate this defect, a negative photograph on glass is taken and placed in front of the camera, at a suitable distance off, with a mirror or reflector placed behind the image at an angle of about 45°, to act upon the principle of the microscopic reflector. The effect of this is, that in focusing in the camera, a clear and well-defined image of the kind required is obtained. The porcelain, or other prepared tablet, is placed in the camera, and the image developed as usual, and fixed with cyanide, or hypo, and washed. Its effect may be heightened by a solution of one grain of chloride of gold to the ounce of water. Various colours and effects may be produced by varying the strength of the solution of gold. The plate is then dried at a fire, at a considerable but gradual heat. When cool it is varnished, and coloured if required.

Photographic portraits may thus be produced on porcelain, china and earthenware, and on white or opal glass, ivory, bone, prepared wood, or white or coloured enamels. Stereoscopic pictures may thus be produced on opal, or white, or ordinary glass.

The chief essential features of the invention are, the production of direct positive pictures on *white* surfaces in the camera; the mode of employing the mirror; and the production of positives by both, or either modes, on hard surfaces, such as porcelain, ivory, mother-of-pearl, &c., which are not adapted for receiving impressions in the ordinary printing-frame.

ON THE ADVANTAGES OF AMMONIACAL ALBUMEN IN POSITIVE PRINTING.

BY M. DAVANNE.

[*From the Bulletin of the French Photographic Society for December*, 1857.]

At the last Meeting of the French Photographic Society, the following communication was read by M. Davanne:—

"The idea of adding ammonia to the albumen used in photography, is not new. M.M. Humbert de Molard, and Bayard, alluded to it a long time ago, and if I now recall the attention of the Society to this old fact, it is because I am not aware that any one has made use of the suggestion in positive printing. It should doubtless have been employed in this process; and those photographers who have introduced ammonia into the iodized albumen for negatives, ought certainly to have introduced it into their chlorized albumen for positives.

"The following simple process, appears to me to offer some advantages:—

"I first prepare the albumen bath in the ordinary way, thus:—

Whites of eggs..300 cubic centimetres.
Water..........200 „ „
Salt............ 25 grammes.

"I then add about 25 centigrammes of pure ammonia. The proportions of albumen and water must be varied according to the amount of glaze which it is thought desirable to obtain. The common formula is to put equal parts of albumen and water. But in imparting fluidity to the mixture, the ammonia destroys a little of the brilliancy of the proof, so that rather more albumen must be added to make up for this loss. The mixture is beaten up in the usual way to a stiff froth and allowed 12 hours to settle, but it must not be put into a varnished bowl, for ammonia attacks certain varnishes very rapidly.

"Albumen, prepared in this way, possesses the following advantages:—It does not form streaks,—gives fewer air bubbles,—can be filtered easily through paper,—and may be kept for several months without undergoing decomposition, so that it may be used to the last drop, without any waste. The ammonia, being very volatile, evaporates completely during the drying of the papers, so that there is no fear of its introduction into the nitrate bath. It may possibly affect the sizing of the paper, but I have not yet perceived any bad effects arising from this cause. My prints precisely resemble those which I obtain by the ordinay process.

"I believe this bath may be kept a very long time, for after four months, I find it as good as on the first day of its preparation. It should be strained before use, and a few drops of ammonia added from time to time, until it smells strongly of that substance. When the bath gets low, fresh albumen may be added to it."

A NEW NEGATIVE PROCESS ON GLASS.

BY MR. G. R. BERRY, OF LIVERPOOL.

[*The following communication was kindly sent to us for insertion by the Secretary of the Liverpool Photographic Society. It contains the substance of some remarks made by Mr. Berry at the last Meeting of that Society.*]

The outline of the process is as follows:—

Take any quantity of skim milk, and precipitate the casein with acetic acid. Drain away the serum, and wash copiously with cold water. Then dry at a temperature of 100° Place the pulverulent mass in a bottle, and well wash with ether, to dissolve the fatty matter with which it is contaminated; then dry again, and preserve for use.

Dissolve the casein, (the quantity must be ascertained by experiment), in dilute ammonia, and to each fluid ounce add about 8 grains of any alkaline iodide, (the metallic iodides cause a partial precipitation of the casein).

Coat the plate with this solution, and allow it to set.

Now comes the most important part of the process. Casein, at a certain temperature, combines with oxygen, and becomes transparent and insoluble. Expose therefore the plate to a temperature of 212°, either in a cool oven, or in the steam of boiling water; when quite set, the plates may be stored away for use.

Excite in a 30-grain bath, faintly acidified with nitric acid.

Develop with pyrogallic and citric acid, as acetic acid softens the film.

Fix with hypo. The plates, when dried at a steam heat, are perfectly hard, and not at all liable to injury by contact.

A useful suggestion, made by Mr. Berry was, that if the negatives, by this or any other process, were weak, to strengthen them with an old solution of hypo, containing chloride of gold, by which means the intensity is much increased.

As far as is at present ascertained, the exposure for wet plates is about double that required for collodion. If the plates are washed and dried, about three times that exposure is necessary.

Mr. Berry has promised to give further particulars of this process on a future occasion.

LIST OF THE MEDALLISTS FOR PHOTOGRAPHY, AT THE BRUSSELS EXHIBITION OF 1857.

MEDAILLES D'EXCELLENCE.

M.M. Charles Negre; Baldus; Nadar.

MEDALS.

M.M. Bertsch & Arnaud; Roger Fenton; Paul Perier; Delehaye & Sluyts, (Antwerp); Giroux; Alary, (Algiers); Mailand; Paul Delondre; Soulier & Clouzard; Paul Gaillard; Maxwell Lyte; Ivan Izabo, (Edinburgh); Marquis de Berenger; Wothly, (Aix-la-Chapelle); Jeaurenaud; Ghemar & Severin (Brussels); Richebourg; Lemercier; Rejlander.

HONORABLE MENTION.

M.M. Radoux; Toulouse; Pretsch; Davanne; De La Blanchere; Jonet; Crette, (Nice); Duboscq; Comte de Favieres; Flottwell, (Dantzic); Barnes & Judge; Dartois; Gerothwohl & Tanner; D. Johnson, (Blackburn); Herman Krone, (Dresden); Michelet; Dandoy Brothers, (Namur).

A medal was given to M. Jamin for Optical Instruments, and to M. Marion, for Photophic Paper.

LIST OF PATENTS, COMPLETED AND UNCOMPLETED, FOR IMPROVEMENTS IN PHOTOGRAPHY, DURING THE YEARS 1856 AND 1857.

March 18th, 1856.

No. 645.—ARTHUR MAW of Brosely, Salop, Manufacturer of Encaustic Tiles. "Improved means of ornamenting the surfaces of woven, knitted, or felted fabrics, such as cloths, stuffs, ribbons, and other fabrics; or of parchment, vellum, leather, or other animal tissues, and rendering such fabrics or tissues applicable to various purposes." —Not completed.

April 12th, 1856.

No. 875.—LUDWIG SCHULTZ, of Green Street, Stepney, Middlesex, Photographic Artist. "Improvements in obtaining photographic pictures upon paper, glass, metal plates, and other fibrous substances."—Not completed.

April 15th, 1856.

No. 896.—WILLIAM HENRY OLLEY, of 2, Brabant Court, Philpot Lane, in the City of London, Wine Merchant. "Taking photographic impressions or pictures of microscopic objects by reflection, such reflection being effected by the combined aid of the microscope and camera-obscura, and camera-lucida, or other reflectors that may be employed in the place of the latter." — Not completed.

May 8th, 1856.

No. 1078.—LOUIS FREDERIC MAYER, of 133, Regent Street, Middlesex. "Improvements in photography."—Complete, but no specification filed.

May 13th, 1856.

No. 1123.—ALEXANDER PARKER, of Birmingham. "Improvements in the use of collodion in photography.—Not completed.

May 16th, 1856.

No. 1159.—WILLIAM THISTLEWAITE, of 2, Verulam Buildings, Gray's Inn, London, Gentleman. "Certain improvements in photography."—A communication from Louis Angamarre of Paris. —Completed.

May 21st, 1856.

No. 1201.—ALEXANDER HENRI DUFRESNE, of 39, Rue de l'Echiquier, Paris. "An improved process of gilding and ornamenting steel and other metals."—Completed.

May 31st, 1856.

No. 1295.—FRANCIS FOWKE, of Pall Mall, in the County of Middlesex, Captain in Her Majesty's Corps of Royal Engineers. "An improved portable photographic camera."—Not completed.

June 5th, 1856.

No. 1344.—DUNCAN CAMPBELL DALLAS, of Islington, Middlesex, Gentleman. "Improvements in chemical preparations applicable to the photographic and photo-galvanographic processes."—Not completed.

June 10th, 1856.

No. 1373.—THOMAS SKAIFE, Vanbrugh House, Greenwich, Kent. "Spring folding camera shutters, for the more speedy and convenient mode of taking photographic pictures than has been hitherto adopted."—Completed.

July 12th, 1856.

No. 1651.—JOHN AVERY, of 32, Essex Street, Strand, London. "An improved plate-holder for photographic and other purposes." A communication from Madame Millot, of Sault-les-Rethel, France.—Completed.

August 26th, 1856.

No. 1983.—John Perry, of 14, Great Portland Street, Middlesex, Artist." Improvements in photography."—Completed.

September 1st, 1856.

No. 2029.—Richard Hill Norris, M.D., of 46, Stafford Street, Birmingham, in the County of Warwick. "Certain improvements in photography, by the use of collodion in a dry condition, and for a means of transferring photographic films."—Completed.

September 5th, 1856.

No. 2064.—John Benjamin Dancer, of the city of Manchester, Optician. "Improvements in photographic cameras, and in the apparatus connected therewith."—Completed.

Ditto.

No. 2072.—John Johnston, of Ohio, in the United States of America, and of 4, Trafalgar Square, Charing Cross, Middlesex. "Improvements in photographic plates."—Completed.

September 8th, 1856.

No. 2092.—Boniface Sabatier, of Paris, and of 4, Trafalgar Square, Charing Cross, Middlesex. "Improvements in photography."—Completed.

September 26th, 1856.

No. 2254.—Claude Langlois, of Bath, in the County of Somerset, Artist. "Improvements in Photography."—Completed.

November 6th, 1856.

No. 2614.—William Henry Olley, of 2, Brabant Court, Philpot Lane, in the City of London, Wine Merchant. "Improvements in obtaining photographic impressions or pictures of microscopic objects."—Completed.

November 26th, 1856.

No. 2806.—Henry Eastman Palmer, of Stonehouse, Devon, Artist. "Improvements in photographic apparatus."—Completed.

December 3rd, 1856.

No. 2871.—James Kinder Cheetham, of Rochdale, in the county of Lancaster, Doctor of Medicine. "Improvements in the application of photographic pictures to metal and other surfaces, and in rendering the same applicable as printing surfaces."—Completed.

December 5th, 1856.

No. 2887.—William Kloen, of Birmingham, in the county of Warwick, Commercial Traveller, and Daniel Jones, of Liverpool, Photographic Artist. "An improvement or improvements in photography."—Not completed.

February 20th, 1857.

No. 501.—Joseph Glover, of Liverpool, photographer, and John Bold, of Liverpool, Watch and Clock Maker. "Improvements, consisting of extended uses of photography as applied to dials, tablets and pictures."

April 9th, 1857.

No. 1005.—Joseph Purnell, of John Street, West, Barnsbury, Middlesex, Photographer. "Improvements in apparatus for taking photographic pictures."

May 4th, 1857.

No. 1253.—Thomas Beeley Moseley, of 52, Upper Charlotte Street, Fitzroy Square, Middlesex, "An improved pneumatic holder, adapted for photographic and other purposes."

May 27th, 1857.

No. 1511.—William Edward Newton, of 66, Chancery Lane, in the county of Middlesex, Civil Engineer. "An improved method of applying photography to the use of engravers."—A communication.

June 2nd, 1857.

No. 1550.—Charles Shaw, of Birmingham, Photographic Mat Maker. "A new or improved manufacture of mats for photographic and other pictures."

Ditto.

No. 1843.—William McCraw, of Edinburgh, Artist. "Improvements in the production of photographic pictures."—Not completed.

July 7th, 1857.

No. 1883.—Peter Hippolyte Gustave Bérard, of 323, Rue St.-Denis, Paris. "Improvements in manufacturing azotic cotton or pyroxile, for photographic and other purposes."

Ditto.

No. 1884—Peter Hippolyte Gustave Bérard, of 323, Rue St. Denis, Paris. "Improvements in manufacturing and applying concentrated collodion."

September 1st, 1857.

No. 2295.—Robinson Elliott, of South Shields, in the county of Durham, Artist. "Improvements in photography, by which the lensular defects of the present processes of taking photographic prints are avoided, and impressions are obtained of any size."

September 4th, 1857.

No. 2315.—Jacques Alexander Ferrier, of Paris, France. "Improvements in transparent photographic pictures, and their application to stereoscopes."

September 7th, 1857.

No. 2332.—William Lewis and William Henry Lewis, of the City and State of New York, U. S. "Improvements in plate-holders, or frames for photographic purposes."

September 22nd, 1857.

No. 2459.—Alfred Vincent Newton, of 66, Chancery Lane, Middlesex. "Improvements in obtaining photographic pictures." A communication from D. A. Woodward, of Baltimore, in the United States of America.

September 28th, 1857.

No. 2494.—Richard Quin, of 5, Rodney Street, Pentonville, Middlesex. "Improvements in the construction of cases suitable for containing photographic and other pictures."

October 5th, 1857.

No. 2551.—Louis Beckers of New York, U. S., Chemist. "Improvements in apparatus for exhibiting daguerreotype, photographic, and other stereoscopic views and pictures."—A communication.

October 6th, 1857.

No. 2560.—Richard Archibald Brooman, of 166, Fleet Street, in the City of London. "Improvements in apparatus for taking photographic pictures."—A communication from M. Garella.

October 8th, 1857.

No. 2574.—Thomas Grubb, of the City of Dublin, Engineer. "Improved photographic lens."

WHIPPLE'S PROCESS.

[*Extract from Humphrey's Journal.*]

After numerous experiments, I have settled upon a modification of the original formula of Whipple's Albumen Process, which has annihilated many defects that were formerly of constant occurrence, and gives me plates, remarkable, among other merits, for their keeping qualities.

The original formula, now largely used in England, is as follows:

Albumen........................	1 oz.
Honey............................	7 drachms.
Iodide of Potassium...........	$22\frac{1}{2}$ grains.
Bromide of Potassium........	$3\frac{3}{4}$ „
Chloride of Sodium............	1 „

The modifications I suggest are as follows:

To substitute for 87 per cent. of honey, 50 per cent. of syrup, made as follows:—To one pound of white sugar add half a pint of hot water; when thoroughly dissolved, put it on the fire until it comes to a boiling heat, and *instantly* remove it. This syrup will dry very hard, *without crystallising*. The film made with it appears to undergo absolutely no decomposition in, at least, 45 days, while the honey film, more deliquescent, will decompose in a few days. To reject chloride of sodium altogether, and to use the salts of ammonium instead of potassium, *reducing the iodide at 12 grains at the most.* The iodide and bromide of ammonium should be thoroughly dissolved in the smallest necessary quantity of distilled water, before adding them to the albumen. Since I have used iodide of ammonium, and taken this precaution of dissolving it, two besetting annoyances have disappeared, viz., small punctures in the film, especially in the sky, and black puddings, that start out like notes of exclamation, during the development. The quantities I commonly use, to the ounce of albumen:

Iodide of Ammonium...........	12 grains.
Bromide of Ammonium.........	5 „

I have used also the following proportions:

Iodide of Ammonium............	$9\frac{1}{3}$ grains.
Bromide of Ammonium.........	$6\frac{2}{3}$

which is in the ratio of their atomic weights. The result was a very satisfactory one as to the fine qualities of the negatives and the beauty of the half tones, but the sensitiveness appeared somewhat diminished.

The modified formula will read as follows:

Albumen............................	1 ounce.
Syrup................................	$\frac{1}{2}$ „
Iodide of Ammonium............	12 grains.
Bromide of Ammonium.........	5 „

The nitrate bath should be 45 grains to the ounce of water, and 20 per cent. of acetic acid, No. 8, added, and should be *saturated with iodide of silver.* I believe this to be as important in this process as with collodium, especially if the plates are to be kept any length of time. Immerse the plates for half a minute, and then wash under a tap or hose until a drop may be drained from the plate upon the tongue without giving a taste of the bath. I find that a gentle stream, from a half-inch hose, passed slowly ten or twelve times over the whole face of the plate, is sufficient; and this will take about two minutes.

Of the keeping quality of plates prepared by the above formula I can give the following evidence: I have produced perfect negatives, on plates prepared severally four, nine, twelve, twenty-four and forty-three days before exposure, giving the *same exposure* to each, viz., 6 minutes on a bright day, with a Harrison lens, 13 inch focus and $\frac{1}{2}$ inch aperture. An examination by the microscope showed no change whatever in the coating of the oldest of these plates, and I have every reason to believe that it would not have lost its quality if kept three times as long. Three weeks of *undiminished* sensitiveness, are, however, sufficient for all practical purposes.

Geo. B. Coale.

Baltimore.

Mr. Brown's Paper. Continued from our last.

many a fair plant in the dark hollows of his mouldings, or clustering around some spreading capital showed how sincerely and dearly he loved her. His *life* was in his work, he followed it because he loved it, and engaging him by day, and at night mingling with his rest, this all-pervading spirit of love and zeal is to be observed not in him alone, but in those who followed his directions and carried out his projects. Nor can we disbelieve or doubt this when we stand before some wondrous carving in which neither labour, nor time, nor skill has been spared: where the leaves are bent and waving, and full of life and being, arranged not in fantastic and unmeaning scrolls, or issuing from the tails of impossible monsters, but in everything obedient to the laws of Nature and placed as she would have placed them. Nor has anything good

ever been accomplished in architecture but that which has been done in *love*, and in this lies much of the difference between the works of the present and of past ages. There is many a village church of olden time plain and simple, which yet possesses more power and vitality and can move our hearts to a far higher admiration than many a more costly modern work. And why? In the former case the men who built that church loved the forms into which they moulded its stones they chose and thought about them, and the fruits of that love and zeal—who knows not? How many hearts have been awed into silence, and how many by the works of these men have been lifted up in praise. But in the latter case love did not guide the choice so much as fashion, and forms were chosen not because they were beautiful, but because they had been used before, selected in obedience to precedent.

Let those answer to the fruits of that love and zeal who know what it is to gaze in silent admiration at those fair vaulted roofs, with their lines of beauty knit together by the flowers of the field, or as they tread the darkening cloister, indulge in strange and deep thoughts, in which the deepness of its shade mingles: or those who love those quiet rows of holy saints, their hands as in benediction raised, each in his appointed niche, standing so peacefully on some glorious portal, whose height is lifted up towards the clouds and fashioned with wondrous power. Let *all* who have loved the works of these men answer, all that numerous and ardent crowd, which within its ranks contains princes and peasants, old men and children, rich and poor, philosophers and poets, every rank and every degree.

If the students of architecture in the present day would turn to their work with love and zeal, loving their art if not with the devotion of M. Angelo, yet with a fervent and warm affection, feeling pride in being permitted to follow it, and pursuing it with all the zeal and energy of which they are capable, sparing no labour and remitting no endeavour to attain as high a proficiency in and as thorough a knowledge of it as possible; we should see rise before us crowd after crowd of dwellings that would still more enhance the value of home, such as men would delight to occupy, and from which would continually proceed men better and wiser. Towering far above would be public buildings. in whose walls the history of nations would be written, but better still would there be many a glorious edifice, rich in all that beauty, loveliness, and wealth can give, with vaulted roofs, lifted far into the quiet air, and then thin fair spires rising higher and higher still, typical of that religion to the service of which the building is dedicated.

Thus architecture is not the child of archæology, but the offspring of, and thus art, in so far as it expresses the spirit of the time in which it is produced, and the architect that has imbibed the true and living principles of his art feels himself forced onward by the physical, moral, religious and social requirements of his countrymen, the necessities of the body and the needs of the spirit, which are served by the architect, and served by perfect harmony.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

PHOTOGRAPHIC TRANSPARENCIES.

To the Editor of Photographic Notes.

Sir,—I have frequently seen in the Journals enquiries as to the best mode of printing transparencies for the magic lantern and stereoscope. Whilst searching for such a process, I saw in one of the Journals a formula by Mr. Ross, for sun-printing on salted albumen on glass. This I tried, but found it so very insensitive that in the present dull weather I could not, after many day's exposure, obtain a print of sufficient strength.

It then occurred to me to spread the layer of albumen on a film of plain collodion, in order to quicken it. This succeeds quite well, and I can now get in a few hours the same result which before it took as many days to obtain. I imagine the collodion should be of the character suited to dry processes.

The albumen I have used contains 14 drops of saturated solution of chloride of sodium to each egg. Another advantage is, that instead of requiring a bath of 70 grains of nitrate of silver, one of 40 grains will answer the purpose.

I may mention, that in the first experiment, having no simple collodion at hand, I tried some old iodized collodion, not knowing what the result might be; it darkened gradually, like the one on plain collodion, but I thought not quite so quickly.

The experiment was interesting to me, as showing that the outer layer of albumen only was sensitive. I mean to try if your process for paper, of developing with gallic acid, will answer with this process.

G. S. Penny.

Cheltenham, Nov. 23rd.

ON MICRO-PHOTOGRAPHY.

To the Editor of Photographic Notes.

Sir,—Being sufficiently practised in the positive collodion process, I wish to turn my attention to micro-photography, being directed that way by your last number of the *Notes*. I think it a great pity that amateurs confine themselves so much to portraiture and views. Would not an article on micro-photography, by daylight, or artificial light, be acceptable to many, and lead their thoughts in that direction? I have one of Smith and Beck's hospital microscopes, with a two-thirds of an inch object-glass. I find that all parts of the enlarged image thrown by the microscope on the ground glass of the camera are not in focus with an object not perfectly flat. How is this to be remedied? Is there no treatise on the subject of micro-photography? G. H. C.

—With respect to micro-photography. The true interest and value of this branch of photography does not appear to us to lie in the direction in which

Mr. Shadbolt and Mr. Hislop have lately pursued it. Instead of producing minute photographs of large objects, it appears to us that we want to produce large photographs of minute objects. Now it remains for the best makers of microscopic lenses, (Mr. Ross, for instance,—or Messrs. Smith and Beck,—or M. Amadio), to tell us to what degree of perfection they are capable of constructing an object-glass, which shall give a sharp magnified photographic picture of the object; when daylight, or sunshine, or the electric light is employed.

We shall devote an article to the discussion of the optical part of this subject in an early number.

It does not appear to us to offer any serious difficulties, except when a bad artificial light is employed, and pencils of great obliquity are introduced.

In a letter just received from Mr. Atkinson, of Liverpool, he has enclosed a printed description of a new copying camera lately invented and patented by Messrs. Anthony, of New York, and called by them the "Solar Camera." In our next No. we shall insert an account of this instrument and offer some remarks thereon.

In No. 25 of the Journal of the Society of Arts, for May, 1853, there is an account of Mr. Kingsley's apparatus for taking micro-photographs.

[Ed. P. N.]

PHOTOGRAPHY ON WOOD

Mr. G. Robbin, of Huntingdon, has communicated the following process:—

"Hold the polished block of wood before a brisk fire till it is quite hot; then rub over it a piece of bee's-wax till there is a smooth even coat. Hold it again before the fire till the wax runs; then put it in a cool place to dry.

"Coat the waxed block with collodion in the usual way.

"Excite in the nitrate bath by floatation; using a flat dish.

"Print from a negative by interposing between the negative and the wood, thin strips of paper or card, to prevent actual contact; or take a negative on the wood in the camera.

"Develop in the usual way.

"Wash off the developer, but do not fix the picture with hypo or cyanide, as it is not necessary to remove the iodide of silver.

"The picture, whether positive or negative, will be produced in black, on a yellow ground, and is ready for the engraver.

INJURIOUS EFFECTS OF PAINT ON OXYMEL PLATES.

To the Editor of Photographic Notes.

Dear Sir,—A few days ago, I prepared some oxymel plates, which I stowed in a common plate-box, which I had got oil-painted on the outside, a few days previous to placing the plates in it. I placed the plate-box inside my camera, covering all with the large calico bag which I use for changing plates, and strapped tightly up. Three days after, I went out and exposed the plates. On developing them, not one would develop enough for printing with; while a lot of stereoscopic plates, prepared at the same time, and with the same materials, but carried in a changing box, developed well. As it must have been the paint which was the cause, can you tell me how it acted on the plates? I believe white lead (carbonate of lead) is used in most, if not all, oil-paints. Could it be that?

J. Fitzpatrick.

Edinburgh, Nov. 25th, 1857.

—We think it quite possible that the effluvium from a freshly-painted box, might act injuriously on the sensitive plates. About a year ago, a friend of ours fitted up a room for printing in, by development. While the paint was still wet, he hung up a considerable number of sensitive papers to dry, but they all became terribly discoloured in the gallic acid, although everything was apparently right in other ways. This happened invariably during the first week of using that room,—but when the papers were dried in a dark cupboard, in another part of the house, all went on well. One is sometimes apt to attribute failures to a wrong cause, but we believe that in the case we allude to, the paint had a good deal to do with the matter. [Ed. P. N.]

RESTORATION OF PRINTS THAT HAVE BEEN DESTROYED BY SEA WATER.

To the Editor of Photographic Notes.

Sir,—Can anything be done to intensify prints which have suffered as follows:—In a voyage from Australia, the sea water got to them, and has almost entirely washed out the shadows, thus nearly obliterating the picture. I do not know by what process they were printed, or the negatives taken. If you could suggest a cure, you will much oblige G. H. C.

—It is possible that the prints may have simply faded in the ordinary way; but supposing them to have been destroyed by sea water, the external part of the image would probably have become converted into chloride of silver. In this case, the image might be darkened by immersing the print either in ammonia, or a fresh hypo bath, because that would remove the superficial white chloride of silver and expose the dark image beneath. Another way would be, to expose the print for some time to strong sunshine, and then treat it with gallo-nitrate of silver. If G. H. C. would allow us to see, and experiment with, one or two of the prints, we might perhaps hit upon some plan of improving them. If, however, they have simply faded to the yellow tint, in the ordinary way, and are totally insensitive to light, we know at present of no plan of reviving them; but it is probable that some process *may* be discovered for restoring faded prints. Should the yellow substance prove to be, as we suspect, a per-sulphide of silver, it might be possible, (as Mr. Moultrie has suggested), by treating it with a salt of some metal which would combine with the excess of sulphur and form a stable black sulphide, to reproduce a black print. Faded prints should not be destroyed. The time may come when some simple mode of rendering them more presentable, may be discovered.

[Ed. P. N.]

POSITIVE COLLODION PORTRAITS ON TIN OR METALLIC CARDS.

To the Editor of Photographic Notes.

SIR,—Should the following be thought worthy of a place in the *Notes*, for the benefit of amateurs and others who may wish to send Collodion Photographs by post, it is at your service. Having used the same, I can assure you that it will be found quite satisfactory.

1st,—Take a sheet of tin and cut it up into any required sizes. Coat the pieces on one side with japan, holding them to the fire, so as to give them an even coating. When dry, dip them overhead in a bath of pure *Lac Varnish*, made with spirits of wine. When dry pack them away; they are ready for use at any time.

2nd,—Take the picture in the usual way, spreading the collodion on the black side of the tin. Colour and varnish. You may cut them for lockets, &c.; which does away with the necessity of a transfer. If wanted to go by post, place a piece of smooth writing paper on the film side, and paste the overlap down on the back of the plate. A quarter-plate will go through the post in a stamped letter, without any fear of damage. They are therefore useful to send abroad, as more than one-half the pictures that pass through the post are broken.

W. A. HUNTER.
Photographic Saloon, Alnwick.

To the Editor of Photographic Notes.

DEAR SIR,—You will greatly oblige me by answering the following queries:

1.—I had a 30-grain bath which I thought was getting too weak. I mixed two drachms of *fused* nitrate of silver in 1 oz. of water, and added it to the old bath, which was of crystallized nitrate. Now when I put a coated plate into it, and let it stand for one minute, it seems to have got a good enough coating of the silver, but it is not smooth. Then if I let it stand in the bath another minute, it begins to lose its whiteness, and in a short time becomes quite transparent. Do you think the bath is too strong?

2.—I saw in one of the back numbers of the *Notes*, a letter from Mr. Mawson of Edinburgh, stating how to transfer the collodion film to paper. I accordingly made some varnish agreeably to his formula, and succeeded in transferring every one I tried. I have had the varnish made for at least three months, without trying any more till last week, and I cannot now succeed in a single instance without breaking the film. Sometimes the paper will not come off at all, and at others it comes without bringing the film along with it. Could you, or Mr. Mawson, suggest to me the cause of this?

3.—In the last No. of the *Notes* there is a letter from Mr. B. Whillock, about positive collodion pictures on paper. It gives at one part 8 drachms to the ounce of water, and in another part it appears to say that 8 grains of gelatine to the ounce of water is sufficient; is it a mistake? Then he says, "Having the paper and glass ready, lay another sheet on a hot brick, or bricks." Does he mean the bare brick, and if so, what is to be done with this other sheet. I think it is the only sheet that he has spoken of *singly*, or is he meaning, by another sheet, to do a number at once. I suppose the collodion is poured on the top of the black varnish, but will the edges of the varnish not injure the bath?

4.—In the mode of colouring given at the end of your Treatise, how do you apply the coating of gelatine. Is it poured on like varnish, or applied with a brush?

JOHN MCGOWAN
Wigtown.

—1st. Your bath would appear to be too strong, if it dissolves the iodide of silver in the film so quickly as you say. Add a little iodide of potassium to it, and filter. Test the strength of the bath with one of Mr. Wood's silver-meters. This instrument affords an exact indication of the strength of a nitrate bath.

2nd. Will Mr. Mawson kindly reply to this query?

3rd. Will Mr. Whillock kindly reply to this query?

4th. The gelatine is poured on the plate,—not applied with a brush. In colouring a glass positive, you may, if you choose, proceed in this way, First, colour on the bare film. Then varnish the picture. Lastly, retouch again on the varnish. This plan is, we know, employed by several successful colourists of positives. [ED. P. N.]

EXTRACT FROM THE LETTER OF A CORRESPONDENT.

We insert the following extract from a letter from one of our most valued correspondents This gentleman has at different times during the last two years sent us magnificent specimens of his work by nearly every process;—Albumen, Wax-paper, and Collodion, and his prints on albumenized paper are (or were) particularly fine. We trust our readers will consider well the remarks made by him on the subject of printing and toning by the ordinary method :—

"I am disgusted with the prevailing mania, for 'Dry Collodion.' Every month there is some new absurdity. The collodion film is not adapted for Photographic purposes, after it has *once got dry*. It loses completely all its beautiful elasticity and translucency and becomes powdery and opaque. Then I quite agree with you about the free nitrate. There must be a large excess on the film at the *time of exposure*, or you cannot get a soft and artistic picture. I have long given up trying the dry processes that come out, and have made up my mind to work *nothing* but wet collodion. If a dry process were absolutely necessary I should go *to paper*. Don't you feel every time you go out with the wet collodion that there is nothing that can touch it—not even albumen? I have never now any fear whatever about taking negatives. If the light is only good I am quite sure of pictures. I had hardly any failures on the continent—worked away as sweetly and *good-temperedly* (which *is* something!) as could be desired. A friend of

mine has a light basket, mounted on wheels, which pack inside when travelling by rail or carriage. It holds tent, camera, chemicals, and everything, and is just as convenient as the portable apparatus which the calotypist or wax-paper man carries, with the satisfaction of knowing what you've got, and of working the best-known process. I think you are wrong about using pure ether and alcohol for your collodion. My collodion costs about 1½d. per ounce, from methylated ether and "finish" spirit, re-distilled, and I will guarantee it as fine as can be got anywhere. There is most in the *cotton*, and the spirit must be strong. I think there ought to be some bromide in it; 4 to 1 is what I use. I can't satisfy myself yet with plain paper printing. I don't see the matter in the same light as you, but I agree with you that all prints toned in sulphur and gold baths, must fade. I have a portfolio full of what were once exquisitely beautiful prints, rich and vigorous in tone, and they are fast going to ruin, the filthy yellow veil is gathering over them, and they will soon be consigned to the fire. Fortunately I have the negatives. I have now adopted a new style of printing which is scientifically correct (which the old plan is not), and gives most brilliant proofs, with pure whites, on albumen paper; the colour being nearly black. The picture is nearly all metallic gold, and there can be no sulphur. It is much more effective than your sel d'or process, though founded on the same principles, but you will I hope see some good specimens soon.

"Before I conclude I must have a fling at another prevailing mania—that for the small lenticular stereoscopes. I detest the sight of them, and am sorry you advocate them. Little fiddling affairs—they are only fit for toys! There is something grand about the reflecting stereoscope, and if the duplicates were about 12 × 10 to 16 × 12 they would be worth looking at."

—With respect to methylated ether, if a uniformly good article were made there is no doubt it would do well enough, but at present we do not either recommend it or trust it in our own work. We have great doubts about the use of bromide in collodion, unless it be to remedy, to some extent, the effects of a bad sample of ether. As for the reflecting stereoscope, we have a great partiality for it, and nearly always take duplicate pictures to be viewed by reflection. The instrument we use cost only four shillings, and is suitable for pictures 12 × 10 and under, possessing the necessary adjustments. We do not agree with what Sir David Brewster says about the loss of light by reflection constituting an objection to this form of stereoscope. We find, as a rule, that the effects are more agreeable when the instrument is placed in a subdued light, in the middle or back part of the room, than when taken near the window. And then again, when developed prints are waxed and viewed by transparency, the effects are very beautiful. Besides, the model picture is, with this instrument, entirely free from distortion. Large portraits on the whole plate are really superb when viewed in this. It is surprising that the reflecting stereoscope should not long since have become as much a necessity with the amateur photographer, as the camera itself. We have serious thoughts of publishing a pamphlet on the use of it, and of thereby endeavouring to call attention to this simple and admirable instrument. We have almost conceived a contempt for single flat pictures.

With respect to Dry Collodion, we entirely differ with our correspondent. Perhaps an extract from a letter received from Mr. Long may be amusing, as affording an enthusiastic view of the question:

"I'm half mad with Dry Collodion, it is such a perfect success. Everyone who uses the process succeeds. Magnificent results—*no failures!* Every picture comes out as a matter of course, clean, bright and truthful. Half-tones superb; high lights opaque; shadows clean and transparent. In fact the process is all that could be desired."

"*T. Canner*" complains of foggy pictures, and dark stains on the plate. He must prevent diffused light from falling on his plate, either in the camera or dark room, clean his plates properly, and proceed in a careful, workmanlike manner. It is impossible to say in what particular part of the process he is at fault; but photographic operations require much care, cleanliness, and thought: and the art is not acquired without fag and disappointment. Failures are the ordeal through which every photographer must infallibly pass; but all comes right in time. Let him persevere, and not be discouraged. [Ed. P. N.]

"*Darlingtonian.*"—You did not, perhaps, remove the free nitrate of silver from the print, by washing it in ammoniacal water, before putting it into the toning bath. Nitrate of silver precipitates the gold from a solution of the hypo-sulphite of gold. [Ed. P. N.]

☞ *The Letters of "J. L."; Gabriel Davis; Barnard Proctor; "J. J."; "Photogram"; and J. D. Waymouth; will receive attention in our next.*

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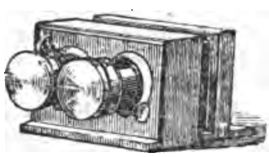

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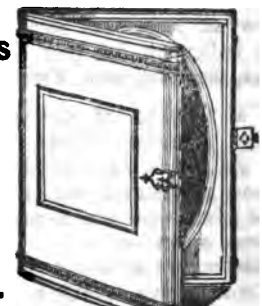

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Photographic Notes.

FEBRUARY 1, 1858.

PUTTING out of the question the possibility of producing photographs in the natural colours, if we were to enquire what would be the *next* greatest improvement that could be made in Photography, the following would, we think, be the proper reply:—1st,—that the photograph should include a much wider field of view than at present; 2nd,—that the picture should be equally sharp in every part, and at the same time absolutely free from distortion; 3rd,—that the exposure should be instantaneous.

Now an important step in the direction above indicated, has just been made by M. Baldus, the celebrated French photographer.

At a meeting of the members of the Parisian Scientific Press, on Monday the 11th ult., there was exhibited a photograph by that gentleman, which had been taken *on one plate*, with the same lens, and at the the same operation, which embraced objects included within an angle of 100°, all parts of the picture being equally sharp and free from distortion, and in which a vast number of figures were introduced, the exposure having been nearly if not absolutely instantaneous. This view was taken in Paris, from the Quai of the Tuilleries, and it includes all objects lying between the Façade of the Louvre on the left hand, and the Dome of the Institute on the right; an angular space of about 100° equally illuminated and equally perfect in the photograph, there being absolutely no difference in the definition between the centre and the margin of the field, and no distortion in the lines of the architecture. The picture contains a great number of figures;—there are boats on the Seine, with their boatmen, persons in various attitudes on the Pont des Arts, and a group of twenty or thirty collected around a musician, forming in itself a picture.

"But how," our readers will exclaim, "was this extraordinary result accomplished?"

The following is all the information we can give them at present:—

The lens was a panoramic lens, the invention of M. Garilla, a civil engineer. It is made to turn in succession towards the different parts of the view, about a vertical axis, while the plate on which the picture is taken partakes of a corresponding movement, so that the necessity for its being cylindrical is avoided. The lens has a rather large aperture, since direct pencils are mostly employed, the principal use of a small diaphram in the ordinary lens being to remedy the defects of curvature of the image produced by introducing very oblique pencils. In this way the photograph is said to have been produced.

More minute particulars of the above instrument will no doubt appear shortly in the French Journals. In the meantime we must wait patiently for further information. Panoramic views have been taken long since by M. Martens, on cylindrical Daguerreotype plates, by means of a revolving lens, but the difficulties of working on a cylindrical surface of glass, and printing from the same, appear to have been so great as to deter persons from experimenting much in this direction.

The subject of taking photographic views which include a wide angular field, and are free from the optical defects due to the obliquity of lateral pencils, and curvature of the image in the common forms of apparatus, appears to be one of such paramount importance, that on hearing of the success of M. Baldus in this direction we immediately set to work to invent for ourselves a panoramic camera which should satisfy the same conditions as that of M. Garilla. This problem has turned out to be a much easier one than we anticipated, so far as we can judge from a form of apparatus which at present exists only on paper; but which we shall lose no time in putting it into the hands of the joiner. The principle on which this instrument is to be constructed we will briefly describe, offering first a few remarks on the optics of the subject.

Suppose a revolving view lens, with a stop in front, placed with its axis of rotation in the centre of a cylindrical focusing screen, and let A, B, be two objects in the view, having an angular distance of 17°. Then, when the axis of the lens is turned towards A, an image, a, will be formed of A, by a direct pencil, and an image b, of B, by an oblique pencil. But when the axis of the lens is turned towards B, the new image of B will not fall exactly on the same part of the focusing screen as before; there will be a difference between the two positions of b, sufficiently great to cause indistinctness in the compound focus, so to speak. This is the first difficulty which occurs in using a panoramic lens, but it can fortunately be diminished as much as we please by diminishing the instantaneous field of view of the lens. This may be easily done by covering the two sides of the lens and leaving only an

open vertical band in the centre. By adopting this plan, only a narrow vertical band of the picture will be exposed at a time, and the only oblique pencils employed will be those from the sky and foreground of this narrow vertical picture. If the lens were now made to revolve backwards and forwards from end to end of the picture, for a proper time, it is obvious that a sharp panoramic view would be produced.

The next improvement would be to introduce a revolving tube, having the lens at one end, and the other end next the picture open, the sides being closed. This would cut off any diffused light from those parts of the picture which were not actually being exposed.

From this arrangement we pass at once to a simple form of Panoramic Camera, for the paper processes.

This would consist of,—the revolving tube, a cylindrical sheet of glass, against the convex side of which the paper would lie, and two vertical rollers, from one of which the paper might be unwound whilst it was being wound on the other, after the view had been taken. With such an instrument photographs might be produced *by the yard*, and the walls of our rooms papered with them. This idea of the rollers is due to Mr. Melhuish. They might be hollow, and made of porous earthenware, and filled with water, or honey, or moist sponges, which would keep the sensitive papers damp. Collodionized papers, preserved in this way, might be found to have important advantages for taking skies and instantaneous views on *paper*. This panoramic camera would not only be infinitely better than the common camera, as an optical contrivance for taking pictures, but it would probably be both lighter and cheaper than the paraphernalia of slides, &c., which the photographer now carries about with him.

The Panoramic Camera for a glass plate appears to involve very little more difficulty in its construction than that for paper.

Instead of the glass cylinder in the former instrument, two cylindrical hoops might be used, one at the top the other at the bottom of the camera, and the slide containing the plate might move round, always touching these hoops in some one point. In order to connect the motion of the plate accurately with that of the lens, nothing more would be necessary than to produce the top and bottom of the revolving tube beyond the back of the slide, and insert between the projecting ends a vertical roller which would press against the back of the slide, and keep it always in contact with the hoops at the point opposite to the lens.

Here then is a simple form of Panoramic Camera for a long flat glass plate. Whether the instrument invented by M. Garilla resembles it or not we cannot say. Our principal object in bringing forward this mere hint of a piece of apparatus which may turn out to be a good form, is to prevent anyone from taking out a patent for a similar thing before we are ourselves ready with the full particulars of it. We conceive that by a free interchange of ideas on this important subject with our readers, and by inviting their suggestions, we may, amongst us, hit upon a new form of camera, which in a short time, may completely revolutionize and upset the present mode of taking pictures out of doors.

We must not omit to mention another great advantage which the Panoramic Camera might possess. Suppose the revolving tube were lengthened considerably in front of the lens, and the front of it closed, all but a narrow vertical opening in the middle; if this opening were provided with a sliding shutter, different parts of the picture might receive a different amount of exposure by causing the front diaphram to be partially closed, while the tube was directed to the part in question.

But more of all this when our plans are matured, diagrams engraved, and instruments made and tried. In the meantime we conjure our readers to give the matter their earnest attention, for it is one which may lead to many extraordinary results.

The Architectural Photographic Association held a *conversazione* at the Gallery, Suffolk Street, Pall Mall, on the evening of Thursday January 7th, Professor Cockerell in the Chair. There was a large attendance. The Chairman delivered an appropriate address, and stated that the number of subscribers was already 750, and that the Association had succeeded in obtaining 360 subjects from Greece, Constantinople, Malta, Italy, Spain, France and Great Britain. These were exhibited, some on screens, others in portfolios, and subscribers of one guinea each, are allowed to select FOUR subjects from certain screens or portfolios; subscribers of more than that amount a certain number from any of the works exhibited. The Constantinople views are taken by Robertson and Beato; those at Florence by Alinari brothers; at Madrid by Clifford; in Paris by Bisson frères, and Baldus; in London by Fenton and Bedford; in Malta by Captain Inglefield; at Leeds by Lyndon Smith; Ipswich by Cade; Malvern by Cutch; Lausanne by the Rev. J. Lisson; and at Chatham by Members of the Engineer Corps. Many of the subjects are well known. The Exhi-

bition will be open daily, as well as on every Thursday evening, until the 18th of February.

On referring to the Catalogue we find that out of the four subjects to which Subscribers of one guinea are entitled, three are of a size not less than 17 ins. by 11 ins., and the fourth 12 ins. by 10 ins. It appears therefore that the Committee of the Association have not entirely succeeded in carrying out their wishes with respect to the number of prints to be given to Subscribers, and we have our suspicions that some disappointment will be felt on this score. Nevertheless their selection of subjects appears to have been very judicious, and none have been admitted which do not exhibit first-rate excellence as regards manipulation. On looking over the list of Subscribers we are surprised to find so few names, comparatively, of well-known photographers and photographic amateurs. The practical photographer never has been, and probably never will be, an extensive purchaser of photographs. With him the desire is rather to produce than to possess.

The Council of the Art-Union of London have in contemplation to issue a certain number of photographs to their Subscribers, and an advertisement has appeared in some of the London Journals, stating that they are ready to contract with photographers for a large number of prints. All these attempts sufficiently prove that there is no want of encouragement to the Art, and if they end in failure, the fault must certainly lie with the printing processes, which every photographer should strenuously endeavour to improve, both as regards rapidity and certainty in the production of prints, and the permanency of the proof, when submitted to the same treatment as other works of art of a similar character. We have received from the Secretary of the Art-Union the following particulars :—

"The photographs are to be taken from Sculpture, Architecture, Paintings, Fresco or Drawings. They must have been hitherto unpublished, and are to be produced exclusively for the Art-Union of London.

"The size is to be from 40 to 70 inches superficial, but not to exceed 10 inches either way.

"A print of each subject proposed, with the price at per hundred copies, including mounting on cardboard, which cardboard will be provided by the Society, is to be sent to the Society's office on or before the 13th of February next.

"Two hundred copies will be required by the beginning of August next, and every print must be warranted to be gold-toned and thoroughly washed."

The Exhibition of the Photographic Society will shortly be opened, at the South Kensington Museum. We hope to be able to pay it a visit in the course of the Spring,—as also the next Exhibition of the French Society, at Paris,—and such remarks as we may have to offer on these Exhibitions will be laid before our readers on the earliest occasion.

We are very busy just now with a Photographic Dictionary, which we hope to be able to publish in April. Some of the "copy" is already in the hands of the printer. Should any of our readers have any suggestions to offer on this subject we shall be very glad to benefit by them.

M. Gaudin has given the following composition for an artificial light, for photographic purposes, which he says answers better than any other that he has tried :—

"Mix together 12 parts of chlorate of potass, 3 parts of sulphur, and 1 part of sugar, all in fine powder." This composition when lighted, is placed in the focus of a parabolic or elliptic reflector, and the sitter or pressure frame in a suitable position for receiving the reflected rays. The elliptic reflector is for portraits, and should be about 6ft. in diameter; the light should be in one focus, and the sitter at the other focus of the reflector. The parabolic reflector, for printing on dry collodion, should be about one foot in diameter, and the focus about 16 inches in front of it. An exposure of one second is generally sufficient.

In the latter case the curve of the reflector need not be very exact, since there is actual contact between the positive and negative. Any tinman could make a reflector sufficiently good for the purpose.

A correspondent of Humphrey's Journal gives the following formula for transferring collodion positives to glazed leather :—

"To one ounce of alcohol add 16 drops of nitric acid. When the positive is dry, wet it with the above solution, and the leather also, and press the two wet surfaces together until dry, when the collodion film will adhere to the leather."

Signed "R." Hudson, (N. Y).

We have frequently been asked for a good formula for spirit varnish. Here is one, for which we have to thank M. Gaillard,—

"Dissolve 10 parts of benzoin in 100 parts of alcohol, S. G. 817. Heat the plate before applying it."

The various matters which we have promised to insert, as also the continuation of our articles on printing by development and the theory of photographic lenses will appear as soon as our space permits.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, December 18th, 1857.

The PRESIDENT read a letter from M. Migurski, of Odessa, which stated, that after having tried a great number of the common photographic methods, he had found them all more or less imperfect, but had succeeded to his satisfaction by a modified process of his own. He enclosed some specimens, which were greatly admired, and it was proposed that application should be made to him for the particulars of his process.

M. MIGURSKI's letter also stated that a number of photographers, in Odessa, having obtained permission of the Emperor, were about to form a Photographic Society in that town.

M. CIVIALE, son of the celebrated Surgeon of that name, a member of the Institute, presented to the Society a series of views of the Pyrenees, from paper negatives. They were remarkably fine, and artistic. Everybody admired one view in particular of a Châlet, situated in a beautiful valley and overtopped by fir trees.

Some photographic copies of rare manuscripts in the Convent of Mount Athos, taken by M. LEVASTIANOFF, a Russian State Councillor, were also exhibited and excited much interest.

M. FRANK DE VILLECHOLLES stated that in his hands a dry collodion process, in which the plates were simply washed after being excited, gave very satisfactory results.

M. PESME said that he had received some dry collodion plates from M. MONTREUIL, of Tonnerre, (see *Notes*, No. 26). which he had exposed and developed several days after their preparation. The negatives turned out extremely good. These plates had been simply washed after removal from the nitrate bath, and dried. The only condition of success in their preparation was stated by M. MONTREUIL to be, that the collodion and bath should work well in the ordinary wet process. The exposure was about double of that required for wet collodion.

M. EDMOND BECQUEREL read a Paper and exhibited experimentally some processes for the production of photographs in colours. It does not appear that there was anything new in this communication, which was little more than a repetition of the Paper read before the Academy of Sciences, in January 31st, 1848. We shall return to this subject on a future occasion; although we wish it to be understood that we have no faith in the probability of the problem of reproducing objects in the natural colours ever receiving a satisfactory solution.

M. LEBORGNE described the Negative Collodion Process, in which he adds a salt of lead to the silver bath. The particulars were given in our last Number.

M. VIELLE described a convenient form of tent for working the wet collodion process out-of-doors. From the description, this tent appears to resemble so closely that which we employ in our own photographic peregrinations, that we shall defer the description of it until we can find space for a separate illustrated article.

M. PAUL GAILLARD gave the recipe for a varnish for collodion negatives, which he said fulfilled completely all the necessary conditions of a good varnish. The formula is as follows:—

"Dissolve 10 parts of Benzoin in 100 parts of alcohol at 40° Beaumé (i. e. S. G. 817). Heat the glass before applying it."

M. RELANDIN exhibited a new form of dark slide for negatives. It was constructed on the same principle as that of Messrs. Marion, and contained two glasses separated by cardboards, being exceedingly light and portable.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

General Meeting, December 29th, 1857.

The Vice-President, W. HOWELL, ESQ., in the Chair.

The Minutes of the last meeting having been passed, MR. C. L. HAINES read the following Paper:—

THE RISE AND PROGRESS OF PHOTOGRAPHY.

It is both interesting and instructive to trace an art from its earliest discovery, in its gradual increase to the time when to all appearances it has nearly reached perfection; to follow the windings of the stream of science as it flows towards the great sea of knowledge to which it tends; to seek out the first springs from which the river flows and to follow its course as it joins other springs and thereby increases, little by little, until a wide and deep river is the result. Who would imagine as he contemplates the little springs that give rise

to the Thames—that mighty river—that little by little those springs would increase until at length they bear on their bosom the wealth of Europe. Such is Photography. Look back to the 16th century, (for even thus far back we can trace the commencement of this now important and still increasing science) look back, I say, to the 16th century, when the alchemists first stumbled, among other things, upon a peculiar combination of silver with chlorine, which they called horn-silver; when they first observed that this horn-silver, by being exposed to the light, became blackened, who then upon looking upon this first spring, as we may call it. of Photography, would have imagined that from that very fountain-head such mighty waters would in time proceed. But so it is, and we have already arrived at the time, after many hindrances (for the progress of discovery must be and ever has been slow) when we see the stream, as it were, fast increasing in width and depth and pouring on, as day by day, we might almost say hour by hour, it approaches that great sea of perfection which all lovers of the art, and in fact all men must wish to see it reach. Little did the alchemists themselves think in that early age, of what a tree of knowledge they had planted the seed. That seed, as it were, lay buried in the soil of obscurity for many years, till at last it burst the soil and continued increasing little by little to the present time. Who would imagine upon examining the little acorn which lies unnoticed in the forest, that from that apparently worthless thing, in years to come, a mighty tree would grow, that may be in years yet later, that little acorn would form a part of a mighty vessel, on whose success all the wealth and prosperity of Europe may depend; but so it is. Photography is flourishing as a tree. It has been planted by our forefathers, for years it has been almost forgotten, and now we again behold it as a mighty tree, which although not at present near its full growth, is already an ornament to that forest of arts and sciences of which it forms a part. To trace the growth of Photography from the time of its very first discovery by the alchemists, and its progress through difficulties which it would seem almost impossible to have surmounted, to follow the science from year to year as it increases, is the object of my present Paper (and I must here beg your forgiveness if I am unable to tell you any thing that is new, for I know that so many Papers have been read, and so many lectures given on this subject, of late years, that it is almost impossible for any one to write what has not at some time or other been written before). I shall only therefore, in as few words as possible, trace out the progress of this interesting art, as far as I can, from the sources I have been able to obtain.

But before I begin to investigate the origin of Photography, it may not be out of place if I say a few words on the nature of light.

Hunt says, "It is now established that the sun's rays cannot fall upon any body without producing a molecular disturbance or a chemical change. Wherever a shadow falls, a picture is impressed. It matters not whether the material which receives the image be one of these chemical compounds which are so susceptible of change, or a plate of metal, or a block of stone. The surfaces of all material things are constantly, under the influence of sunshine, undergoing a mysterious change, which is communicated by molecular vibrations to the entire mass, and new conditions established, which, with all the powers of chemistry, we cannot yet follow."

Thus we see, that whether visible or invisible to mortal eyes, the light of the sun has its effects on all things,—on animate nature, we know it has its effects in promoting the health and vigour of the frame. On the vegetable kingdom also we know its effect, for without it no plant or herb would grow. It has been proved beyond doubt that it is not only the heat of the sun which causes plants to grow, but that heat alone, without other chemical agencies of light, would have no effect. If we could look into the depths of the sea, we should discover that at a very considerable depth, where the light connot penetrate, would be an eternal blank; no sign of vegetable or animal to be found. As we ascend into where the light but faintly illuminates, a few animal and vegetable productions could be discerned: but near the surface we should find quantities of animals and every species of sea vegetables of all colours.

Even on our globe the power of light is plainly to be seen. Look at our Arctic regions, and you will find, in consequence of there being little sun there, that all creation has a darker appearance than elsewhere. As you approach more temperate climes you will find the flowers, and all other things, of a much brighter hue, and in the tropical climes they will be found to glow in richness and splendour of colour never to be surpassed.

We all know that if a bright flower had never seen light it would have had no colour, but would have been perfectly white. How wonderful then is that light to which we owe all the beauties of this our world, and how merciful was the Maker of all, in thus, before any other thing was created, giving the Divine command: *Let there be light.* All we are told is with sublime conciseness that *God said let there be light, and there was light.* How wonderfully does this in itself show the importance of this element of nature. All things owe their growth and beauty to it. How wonderful must have been the change which thus gave form to the earth and *chased the darkness from the face of the deep.* That light has more power over some substances than over others is easy to be perceived by all who take any interest at all in the subject. Thus, while light may bleach some objects, it may not injure, or may even add to, the colour of others.

But having said a few words on the chemical action of light, let me at once proceed to investigate the "Origin and Progress of Photography up to the present time."

The earliest account that we have of Photography, is as I said before, in the 16th century.

Among the alchemists of that early date there were men gifted with minds of very superior order, as indeed their many careful experiments show. A pity however it is that these men did not give their minds and attentions to things that would have been more gratifying to themselves, and more

useful to their followers, than their fruitless search after the Philosopher's Stone, or their vain endeavours to distil the Elixir Vitæ. In the course of one of their experiments however, in the year 1556, it was discovered that horn-silver, exposed to the rays of the sun, became discoloured. This, after a time, was thought no more of, and we hear no more of the subject until the year 1722. In this year, Petit showed that solutions of saltpetre and muriate of ammonia, crystallized more readily in the light than in the dark. This, however trifling it may seem, is doubtless the link which connects the long chain of experiments which have since been tried, with the previous knowledge of the early alchemists.

In 1775, Kearsley's Pocket Ledger quotes from Dr. Hooper's Rational Recreations, "a Process for Writing on Glass by the Rays of the Sun;" the materials used are "chalk, dissolved in aquafortis to the consistence of milk, and strong dissolution of silver. These are to be placed in a bottle, on the outside of which, letters cut out of paper have been, pasted, and the whole exposed to the light of the sun; the inner surface of the bottle is blackened in all those parts unprotected by the paper."

Two years after this date (1777), the great Scheele gave his first examination of the peculiar change of salts of silver, under the influence of light; and also found that they sooner go black under the influence of the *violet* ray than a ray of other colour. He says, "It is well known that a solution of silver in acid of nitre, poured on a piece of chalk, and exposed to the sun, becomes black." And again he says, "That if you fix a glass prism in a window, so as to let the rays fall on the floor, it will blacken sooner in the violet ray than in any other." Sennebier, in 1790, repeated these experiments, and discovered that the chloride of silver, which would take twenty minutes to blacken in a red ray, would be equally blackened in the violet ray in fifteen minutes. Count Rumford, soon after this time, published a Paper in the "Philosophical Transactions," in which he seems to think that the chemical changes caused by light are attributable to heat, and that light, without heat, would be useless in effecting these changes. He concludes by stating that he considers that the same chemical effect would be produced by a prolonged exposure to a heat of about 210° Fahrenheit.

In the year 1798, however, this distinguished man sent a paper to the Royal Society, entitled "An enquiry concerning the Chemical Properties that have been attributed to Light." In one of his experiments pieces of ribbon were wetted with a solution of gold; those which were exposed to the strong light of the sun, gradually changed colour, and in a few hours acquired a fine purple hue, whilst those left in the dark remained unchanged. It was also found that the change took place much sooner when exposed in a wet state than if allowed to dry before exposure. Mr. Robert Harrup, in 1802, states also that several salts of mercury were discoloured by light and not by heat. In 1802, Wedgwood, who undoubtedly was the first person who made an attempt to copy objects by aid of the sun's rays, published a paper in the Journal of the Royal Institution, entitled "An account of a Method of Copying Pictures, and of making Profiles by the agency of Light upon Nitrate of Silver." From this paper I will make a few extracts.

He says, that "white paper, or white leather, moistened with a solution of nitrate of silver, undergoes no change when kept in a dark place, but on being exposed to the daylight, it speedily changes colour, and after passing through different shades of grey and brown, becomes at length nearly black. The alterations of colour take place more speedily in proportion as the light is more intense; in the direct beam of the sun, two or three minutes are enough to produce the full effects; in the shade several hours are required."

He also states, "that light, transmitted through various coloured glasses has different effects. It is found," says he, "that red, or common sun rays, passed through red glass, have but little effect; those passed through yellow or green glass are more powerful, but those through blue or violet glass have the most decided and powerful effect." No plan, it appears, had at this time been discovered for fixing the image on the paper or leather. He says that neither rubbing, nor even washing in soap and water, would remove the image; and that it was in the highest degree permanent whilst kept in the dark, but that on exposure to the light, the uncoloured parts of the picture would at once darken till it entirely obliterated the image. A transparent varnish was tried, but was found to be entirely unsuccessful, as it did not protect the uncoloured parts from the action of the light.

An attempt was now made to use these sensitive papers to impress the image given in a camera obscura, but they were not sufficiently sensitive to produce good results. Davy, however, succeeded better in some experiments with the solar microscope.

The failure of these two distinguished men seems to have disheartened their successors, for from this time we hear no more of Photography, until the year 1814. In this year Niepce endeavoured to fix the images of the camera obscura. He discovered that light altered the solubility of various resineus substances. He spread a thin layer of asphalte on a glass or metal plate, and placed this in the camera. After waiting from five to six hours he found on the plate a latent image, which became visible upon treating the surface of the plate with a solvent.

In the year 1824, Daguerre (a man whom all Photographers well know as being the inventor of one of our most important processes), also turned his attention to the fixing of images rendered by the camera obscura: with what ultimate success I need not name, for all of us know the beauty of a good Daguerreotype. The first substance tried by Daguerre it appears was paper, soaked in a solution of nitrate of silver,—but this did not satisfy his wishes, and it was not until he became acquainted with Niepce, two years after (1826) that anything further was done in the matter. From this year they as it were joined hand to hand in promoting the great work they both had at heart.

In the year 1829, in a letter, dated December 5th, Niepce communicated to Daguerre his process. "The discovery I have made," says he "and to which I have given the name of Heliography, consists in

this,—that I produce instantaneously, by the action of light, the image of the camera obscura, in all its gradations, from white to black." He then proceeds to explain in detail the method he adopted, but this it is quite unnecessary for me to give. In 1829, Daguerre and Niepce first used iodine to blacken the impressed image.

From the use of iodine for this purpose it appears probable that the celebrated process of Daguerre arose.

In July, 1853, Niepce died, and an agreement was entered upon between Daguerre and the nephew of the late Niepce.

In the year 1834, Mr. Fox Talbot first commenced his experiments for the permanency of pictures on papers, of which experiments we hear no more until the year 1839. In the January of that year he read before the Royal Society a paper entitled "Some Account of the Art of Photographic Drawing, or the Process by which Natural Objects may be made to Delineate themselves without the aid of the Artist's Pencil." The method he suggested was to cover a sheet of paper with a thin coat of chloride of silver by repeated washings. To fix the image, he recommended a solution of common salt, but this he says succeeded but indifferently.

In the March of the same year, Sir John Herschel, in a communication to the Royal Society, recommends the use of hypo-sulphite of soda as a fixing agent, instead of common salt. He also recommends the use of iodide of potassium to convert the nitrate of silver on the paper into iodide of silver.

To trace the different discoveries and improvements from this date is more than either time or inclination will allow, so various and numerous are they; suffice it then if I choose a few, and those few some of the most important of that number.

In 1840, glass plates were first introduced by Sir John Herschel for the purpose of obtaining pictures, a discovery, which under the able hands of the late and much lamented Scott Archer, has since become one of the chief and certainly the most popular of all the photographic processes.

In 1842, Mr. Fox Talbot patented the Calotype, of which process I need say nothing, as it is so well known to all.

During the next few years Talbot tried various substances for the production of Photographic Pictures, among many others I may name porcelain plates as giving satisfactory results, but the difficulty of preparing these is so great that it is probable they will never come into constant use.

In 1848, Niepce de Saint Victor first brought under notice the use of albumen on glass plates, a process, which having been improved upon by Le Gray and several others, gave a clear and perfect image, but which was not sufficiently sensitive for portraits.

In 1851, Mr. Frederick Scott Archer first published in the "Chemist;" the now well-known collodion process, and I need only say by way of a mark of esteem to that gentleman that the sympathy which is all over England being shown to his widow and children can but partially show that gratitude which I am sure all photographers must feel towards a man who spent a great portion of his life in the discovery of a long-wanted process, which it is only a pity for us all that he did not live long enough to practise and improve.

From this time, which must be in the recollection of us all, I will let the matter drop. Of Le Gray's celebrated process I need I am sure say not a word, when we have so beautiful a specimen presented to the Society by one of its members. In fact I cannot, I think, do better than refer you to our late exhibition, to show you how Photography has improved during the last few years. That exhibition will speak for itself, with no weak words of mine to recommend it.

One word though I must say before I conclude. There is a great talk of taking pictures by artificial light. This may be very well in theory, but it will not, in my opinion, do in practice. I commend all who try to make discoveries of any description in the art, but I cannot see what is to be the ultimate good of such an object as this.

For evening scenes, moonlight may be desirable, if practicable, or for the astronomer it would not only be desirable but of the greatest use—but for the taking of *portraits* I can see no advantage. It may be well, as I know it is, to search out the properties of various kinds of light, but further than that I consider the sun's great and best light enough for practical purposes.

One word and I have done. The next and greatest aim of the Photographer is to obtain pictures in their natural colours. Many have been the opinions on this subject. I can only say that if such a process should eventually be discovered, the Photographer could wish no more, and Photography, from the little spring from whence it arose, will at length, after many windings and obstructions, widening and deepening as it flows, have reached its boundary, and flowed into the great ocean of knowledge of which it is doubtless destined to form a most conspicuous part. (Cheers).

Mr. Bourne.—I must say that I am of different opinion to Mr. Haines, respecting artificial light. I consider that it will eventually prove of great benefit to amateur photographers, inasmuch as many of us have little or no time during the day to practise the art.

The Chairman thought that the artificial light would be very useful during the winter months.

Mr. Morris agreed with the previous speakers respecting the advantages of artificial light, and said that the best portrait he had yet seen was taken by that means.

Mr. Osborn said he really could not see that the artificial light would be of such manifest advantage as some persons strove to shew. The great desideratum, a strong diffused light, had not been obtained, and could not well be so, by any method yet adopted. A great intensity of light had been produced, but was confined to one spot, and consequently you had a ghastly white face, starting from a sombre mass; and moreover, the light being too glaring for the eyes, invariably gave that sleepy unpleasant-looking, contraction of the pupil of the eye.

A vote of thanks was given to Mr. Haines for his interesting paper, and the meeting adjourned to January 26th. when a paper will be read by Mr. T. Morris, on "Barnes' Dry Collodion Process," illustrated by experiments and apparatus.

THE SOLAR CAMERA,

BY MESSRS. ANTHONY, OF NEW YORK.

We mentioned in our last number, in the reply to a correspondent, that Messrs. Anthony, of New York, have lately brought out a copying camera, to which they have given the name of the "Solar Camera." Their printed description of this instrument has been forwarded to us, and as we have no doubt it will interest many of our readers we have inserted it verbatim, and added some remarks of our own.

DESCRIPTION OF THE SOLAR CAMERA.

"The Solar Camera consists of an apparatus to be attached to the ordinary portrait tube, for the purpose of using the sun's rays in the enlarging or diminishing of pictures—it is principally calculated for enlarging, however, for which purpose it is invaluable.

"The parts of the solar Camera are,—

"1st,—A mirror, and brass work arranged for holding the mirror in any desired position. By this mirror the sun's rays may be reflected through

"2nd,—A plano-convex condensing lens, which concentrates the light upon the picture to be copied, which picture is placed in

"3rd,—A box, provided with a slide, for the purpose of adjusting the picture to be copied in its proper position or focus. At the opposite end of this box, from the mirror, is to be attached a portrait tube, screwed on in the usual manner."

Instructions for using the Solar Camera.

"A positive picture of the subject to be printed must first be obtained by the ordinary collodion process.

"The glass upon which this picture is taken, should be of the best quality, and free from bubbles or scratches, as the least imperfection will deface the print.

"This picture should be sharp and well-defined, and in other respects slightly differing from the ordinary Ambrotype. A little experience will readily indicate exactly the kind of picture requisite.

"To print the picture, it must be placed in the holder made to receive it, in the middle of the box. In using the small-size instruments, the ground-glass holders will answer the purpose.

"When using quarter-plates with the small instruments, it will be necessary to place the inside frame, accompanying the plate-holder, into the holder from which the ground-glass has been removed: the brass springs holding it and the picture firm in its position.

"The mirror should now be made fast in its hinge; the segmental rack attached to the frame, passed through the brass plate, and held by the cogwheel upon the inside of the box. The brass millhead which is attached to this cogwheel, for the purpose of drawing up the mirror, should never move so easy as to be started by its own weight. If this should occur, it may be obviated by tightening the screw in the centre of the millhead. Should it wear loose, it should be unscrewed, and a piece of paper or thin leather placed to its shoulder.

"The picture having been placed in the camera, with the collodion side towards the tube, the instrument should be then placed at a sun-exposed window. The sash should be raised sufficiently to allow the running out of the mirror. The light then may be completely excluded about the instrument, thus furnishing a darkened room.

"The mirror must now be brought to its reflecting angle.

"This is accomplished by the combined movements of the brass millheads, which hold the segmental rack, attached to the mirror frame, and the one placed outside of the box. A small steel lever, accompanying the instrument, will assist in the operation.

"The light passing through the large condensing lens (the convex side of which should be placed towards the mirror), and through the glass picture, is brought to a focal spark upon the lens of the tube farthest from the mirror; and by racking the tube, it can be brought to its smallest and finest definition; from thence spreading its rays upon the prepared paper. To insure a complete distinctness in the resulting print, the focal part must be retained constantly upon the centre of the outside lens, which can easily be done by occasionally moving the above named millheads, one or the other, as may be found necessary. In order to aid in the retention of the focal spark, to the required position a diaphragm or cut off with an aperture from a half to three-quarters of an inch in diameter, may be placed against the lens on the outside. This diaphragm may be made of tin.

"As the sun is brought into the instrument, the motion of the mirror should be nearly continuous, as the focal spark, in its passage, will burn the parts inside of the instrument upon which it is allowed to remain.

"The image may be focused by means of the racking wheel at the side of the box, before turning on the sun-light (the diaphragm being kept off), by observing when the lines at the centre of the image are most distinct. The light at this stage not being sufficiently strong to impress chloride of silver held in the paper.

"The mirror now may be revolved, bringing in the sun-light. By a little practice upon unprepared paper, all will be found easy to manage.

"The progress of the printing operation may be examined by holding a piece of ground-glass or white paper in front of the tube.

"The size picture best to use with the small instruments, is that of quarter-size, and with the large ones half, or two-thirds image.

"The best portrait-tube to be used with the small sized Solar Camera, is the half-size, and with the large one, the two-thirds Harrison quick worker.

"The pictures may be taken on paper prepared either by the ammonio-nitrate process, or by the calotype process of Sutton—the subsequent treatment of them being the same as in ordinary photographic operations.

"It will be prudent in all cases when the instrument is left unguarded, to turn the mirror around so that the light cannot be passed through the condensing lens; as the great heat at the focus of this lens will easily produce combustion.

"E. Anthony, 308, *Broadway, N. Y.*"

—With respect to the expression: "A positive picture of the subject to be printed must first be obtained by the Positive Collodion Process." The meaning is evidently a positive collodion picture, in which the lights are the opaque, and the shadows, the transparent parts. A collodion negative would probably answer the same purpose better, from the greater opacity of the reduced metallic precipitate.

The Solar Camera is like an ordinary camera, fitted with a portrait lens, and having its end open. Inside, and very near the open end, is placed a thick plane-convex lens (or condenser) with its convex side outwards; and outside the camera is placed a reflector, which is a plane mirror, capable of receiving such adjustments as may be necessary for throwing reflected sunshine directly through the condenser. The transparent photograph to be copied is then placed in the camera, between the condenser and the portrait lens. Its image is formed on a sensitive surface placed to receive it, which must be supported in some way on a screen, as no provision has been made for attaching a holder to the instrument. The image is of course very bright;—sufficiently so for producing a sun-print, if required.

The description of this Solar Camera will now, we trust, be sufficiently intelligible.

We have some remarks to offer on the subject of copying transparent photographs by transmitted light, which we consider very important.

In copying an engraving or paper print, the light portions are composed of an infinite number of bright points, each of which is the origin of a pencil of light which diverges from it, passes through the lens, and is refracted to a focus which is "conjugate" to the origin of the pencil. But if the lights of a picture to be copied are pure transparent glass, and not formed of an assemblage of bright origins of light, the case is vastly different; and we cannot suppose that the dark parts of the picture radiate pencils of darkness.

This being understood, let the reader consider what would happen if a transparent photograph were held between the copying lens and the sun;—that is to say, placed in a cylinder of luminous rays having parallel directions. It is evident that parallel rays would in this case pass through all the transparent parts of the photograph, and *come to a focus in the principal focus of the lens*, from which rays would again diverge.

Now, if the office of the condenser is simply to transform a cylindrical pencil of solar rays incident upon it, into a conical pencil, converging to a focus, an image of the sun will still be produced by rays passing through the transparent parts of the photograph.

It would appear, therefore, that some difficulties are likely to occur in copying a negative by solar light, transmitted through it in the way proposed by Messrs. Anthony, when the lights of the negative are *perfectly* transparent, and allow the light to pass through without being diffused.

In the case of the magic lantern, the condenser can be shewn to have the property of scattering rays of light in all directions, *within a certain space*, and in this way of forming diverging pencils, whose origin is on the surface of the painted slide.

The best luminous background (so to speak) for a transparent photograph to be copied, is either the sky, or a white surface strongly illuminated. The consideration of how such a background would act in producing pencils of light which diverge from the picture, is very instructive and important. Let us suppose that a piece of blackened glass, has a single minute transparent hole in it;—the sky being on one side of the glass, and a lens on the other. It is evident that every part of the lens might receive a ray of light through the hole, from some portion of the sky, and that in this way the hole might become an origin of a diverging pencil of light covering the surface of the lens. Now the light portions of a transparent negative may be considered as made up of an infinite number of these minute holes, every one of which could become an origin of a divergent pencil; and therefore, when a transparent negative, with the sky as a background, is placed before a lens, an image of it would be formed in precisely the same way, as if it were an opaque paper print, illuminated from a source of light in front.

It would appear from these considerations, that the arrangement proposed by Messrs. Anthony, would be extremely likely to produce fog and a general darkening of the sensitive surface on which the copy is to be made;

while the way to avoid such an evil would be, either to do away with the mirror and condenser, and use the sky as a background, or to introduce a semi-transparent screen between the picture to be copied and the source of light, in order that the light might be properly diffused.

If, in the Solar Camera of Messrs. Anthony, the lights of the picture to be copied are perfectly clear and transparent, they will not prevent the condenser from forming the "bright spark," or image of the sun on the front combination, and the rays which would be scattered by such an image would, we imagine, be nearly certain to fog and blacken a sensitive surface placed opposite to it.

These considerations are well worthy the attention of those who are about to employ copying cameras, or to practise Micro-photography.

[Ed. P. N.]

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ACCOUNT OF A PHOTOGRAPHIC TOUR FROM JERSEY TO THE PYRENEES.

To the Editor of Photographic Notes.

Dear Sir,—You asked me before I left Jersey, to write and give you an account of my journey to this place, and as all accounts of photographic rambles in search of the picturesque are full of interest to me, I take it for granted that the Editor of the *Photographic Notes,* and his subscribers, have the same feeling, and I will now endeavour to give you such information as I should be glad to receive, were I now meditating such a tour as I have just accomplished.

Notwithstanding all your entreaties to the contrary, joined together with your abuse of the waxed paper process, it is the one I have determined to adopt while moving from place to place as when stationary, and in a moderately cool climate, I should give the preference to the Calotype process, which for landscape portraiture, stands unrivalled. I lay stress upon the difference of the two processes, as adapted to the photographer while travelling and when stationary, as the one process obliges you to engage a dark room, which the other does not, and in most places this is a thing which cannot always be found; heat too, that would effect the Calotype process to a serious extent, will have no such effect on the waxed paper. In some of the large hotels in the principal towns which photographers are in the habit of frequenting, the very sound of photography is synonymous with that of dirt, so I go upon the principle that "fortune favours the brave," (say nothing about it) take my rooms and work in them as I like. In one hotel my camera was seen, and when I went into my room at night, I found, by the towels and toilet covers, unmistakeable traces of there having been a worker of the same art before me, and as I had no desire to receive the credit due to him, I suggested that as I had all the necessary dying materials with me, I could apply them myself, if I wished to do so, on fresh towels and covers—they were immediately changed, but I was told "they were quite clean until they had been used by a Monsieur Anglais."

I am quite convinced, by every days' experience, of one thing, and that is, that glass is quite out of the question for this country. Had I been working collodion I should not have had one negative to show twenty miles from the place at which it was taken. In the waxed-paper process, I sensitize my paper in my own room just before going to bed; if the following day should not be fine, I am still ready for the first fine hours that should come, though I may have to wait for it for three or four days. I develop at night, and when the negative is fully out, wash it well and leave it in clean water till the following morning. I then clean the dishes thoroughly, put them by, and excite fresh paper for the next day, place it when finished in the dark slides, clean the dishes and put them by, and then make all ready for fixing the negatives just developed, by the first dawn of daylight. As soon as this appears, I get up and immerse the negatives in the hypo bath, take to my bed again for half an hour; when it is time to get up, I examine the pictures, and if finished, wash them thoroughly. There is little satisfaction in taking unfixed negatives about with one, as their delicacy and fineness of detail are invariably lost by doing so, and if I am unable to wash the picture thoroughly before leaving the place at which it was taken, I manage to do so at the next place at which I stay.

It is very easy for photographers at home to give advice to those about to travel, to do so with as small an amount of chemicals, &c. as possible, and to trust to being able to meet with fresh supplies abroad; but it is a widely different thing to find oneself in a place where nothing appertaining to photography can be obtained nearer than London or Paris. Let me advise no one to go abroad without a sufficient stock of all requisites to last him till he is quite certain to arrive at some place where he is sure to meet with what he requires,—to take with him one extra focusing-glass, which can easily be packed in one of the dishes, and to avoid papier-maché, as he would porcelain dishes, they will bear no rough usage, are apt to crack at the corners, and in this state it is quite impossible to clean them. I recommended their use in the *Notes,* some months since, but I was captivated with their appearance, and had not given them a sufficient trial to test them fairly. I am in hopes that before long we shall be able to dispense with glacial acetic acid. I see Mr. Kinnear has mentioned the substitution of citric or tartaric acid in its stead. Both of these I have used, but not having hit upon the proper quantity, have consequently failed. The citric acid I used in different quantities, from 8 to 16 grains, and came to the conclusion that paper prepared with it, did not keep clean so long as that prepared with glacial acetic acid, while it required a longer exposure in the camera.

I took with me a new camera, by Ottewill, with a Ross's lens for pictures 10 by 12, along with a sufficient quantity of waxed iodized paper to last me till I got to this place. Some of the paper I took with me, I had prepared according to Long's formula, using the iodide and bromide of cadmium with milk. The paper, thus prepared, costs considerably more than that prepared with the potassium; but I think the negative is rather more delicate, and has much less appearance of granulation in the skies, while the general texture of it is more solid and vigorous. I am now busy preparing a stock of paper for a tour through Spain and the Pyrennees, an account of which you shall have, should I live to accomplish it. Almost every photographer has his own formula for iodizing paper, which, in his own hands, may give better results than those of other people. In each batch of fresh paper I prepare, I use less and less of the bromide of potassium, and am inclined to think that it would be better to discard it altogether. I have long since followed Dr. Keith's example, and given up the use of the fluoride and cyanide, with all organic matter, and as you have lately seen many of the negatives taken on paper thus prepared, you will judge for yourself whether I am correct in my supposition. The paper is greatly improved by holding it before the fire, after it has been iodized, the granular appearance of the paper giving way to a fine clear close-looking texture.

I left Jersey on the 29th of October, for St. Malo, where the Custom House officers made a great piece of work with some of my chemicals, and the camera completely puzzled them. I had three or four pounds of hypo-sulphite of soda, very carefully wrapped up in several folds of paper, in my portmanteau, which I had placed there to be out of the way of every thing appertaining to photography, which they pounced upon, and away two officers went with it, I following, protesting that it was not tea, coffee, or even tobacco, each one of which it seems they were certain it must be; at last I got the parcel into my own hands, and opening it, offered to each of them a crystal to taste, which did not satisfy them in the least, and away I had to march with them, and it, to a superior officer, who pulled out a long paper, then a large book, and having looked over them most carefully for the words *Hyposulfite de Soude*, under the head *Acides*, he allowed me to take possession of the parcel once more; the only conclusion I could come to was, that he was no chemist, while his opinion of me seemed much more undefined. Then followed the examination of the chemical case, every bottle of which was regarded with strong suspicion, and held up to the light as though they would tell some awful tale.

It was beginning to get dark, and I was the last in the room; the case in which my iodized papers were kept had still to be examined, but they were sick of photography and allowed it to pass unopened, much to my satisfaction. Had they examined it they would have done it no good, for the contents of the boxes were all turned out, and they had already broken for me a glass dish, which has obliged me to send to England for some Marine Glue, a thing unheard of wherever I have asked for it in this country.

As there is nothing picturesque in St. Malo, I left the following afternoon, sailing up the river Rance to Dinan; as soon as we arrived in this place, I saw there were some good subjects for pictures, and fixed upon the *Hôtel de Bretagne*, as the proper resting place for a photographer, in consequence of its having an imposing-looking pump before the door. If any brother photographer should ever be induced to visit this Hotel, he will find it necessary to make a very strict bargain with "Mademoiselle," for if he does not do so he will find, on leaving, that if she is not "fair" she has the other attribute which is generally said to be its accompaniment. The hotel is however one of the best in that part of France, and has the advantage of being just out of the town, which is exceedingly dirty. The servants were never tired of carrying water and cleaning dishes, and the only thing they expected in return, was a sight of les *jolis tableaux*, with which they were in raptures. The weather was wretched, with the exception of a few hours on one or two days, during the week I stayed here, which however I made the most of, and took good negatives of all that was worth seeing. The Cathedral of "St. Sauveur," which is an interesting specimen of the romanesque style, is admirably situated for the photographer, having a fine open space before it, both on the East and West side. Close to it are some exceedingly picturesque old houses which no artist or photographer could pass by without an attempt to take away with him some slight memorial of. I was so pleased with them that I took three or four views of them from different points. I then went to Lehon, a small village about a mile from Dinan, where are the ruins of an old Abbey, which makes a pretty picture. The Canal is close to it, and there are some charming views on it. After finishing these subjects, I went on to Rennes, where, as there is nothing to induce one to pitch a camera, I passed on to Nantes. The west door of the Cathedral is magnificent, and I greatly regret that I could not stay to take it. There is little else in the town which would induce one to stay in it. The Cathedral itself, externally, with the exception of its noble entrance, is an unsightly building. My next halting place was Angers. In few continental tours will the photographer find a greater number of subjects for his camera than in this fine old city. The Cathedral of St. Maurice, has that drawback to its beauty which it holds in common with most churches of a similar kind, whether in England or in this country—that of being so closely hemmed in with houses as to render it impossible to take it in the camera except in parts; the West door is remarkable for the richness and good preservation of its sculptured figures. A fine view of its beautiful and elegant spires, (spoiled however, in a great measure, by an unsightly pavilion which connects them with each other) as seen towering far above a picturesque old street, making a good foreground and middle distance for a picture of faultless composition, is to be had from the river side. The tower of St. Aubin is a stately and imposing-looking old building, of which I got some excellent negatives; between it and the Cathedral are some exceedingly picturesque specimens of ancient domestic architecture, with which the streets of Angers abound. A Monsieur

Lehon, a photographic artist, possesses a window which has a good view of one of these houses. I had been, on the previous evening, to a chemist's shop to purchase some distilled water, for which an exorbitant price was demanded; it happened that M. Lehon was in the shop at the time, and determined to find me out, which he did the next day, to offer me distilled water, the use of his dark room, and any thing else I might require, with the assurance that the view from the window was *charmant*, so I sent my camera there, and took the view, as well as another view of the same subject from a better point. He had never seen a folding camera before, or any good paper negatives, with both of which he was in raptures. Photography is at a very low ebb throughout the whole of the North of France, with of course one or two bright exceptions here and there. I was in a photographic artist's room, late one evening, when it was quite dark; a knock at the door was soon followed by the entrance of half-a-dozen soldiers who came, *in full dress*, to have their portraits taken; the artist endeavoured to explain to them that such portraits as he took could only be taken by daylight, and I doubt not that they went, as sure, to the next portrait gallery to try their fortunes there, for the general character of the portraits is such that might well lead them to suppose they had been taken at midnight.

The view from the Castle walls of the town of Angers, with the surrounding country, of which you have a fine expanded view, is very charming. It is necessary to obtain an especial order from the Colonel in command, before you can enter the walls of the Castle with the camera; but the view of the Cathedral from there is fine, and well worth any trouble to take. The Castle itself is as ugly and unsightly a pile of stones as could well be put together, and were its historical interest ten-fold greater than it is, we would be at a loss to conceive what any photographer, with an artist's eye, could see in it worth depicting, yet that such persons there are, I was gravely assured by a soldier, who told me that only a few weeks before that time "some English gentlemen had been photographing it."

Not far from the "Musée" is the ruined Church of the "Toussaints," which would well repay the photographer had he an hour or two to devote to it. The morning I saw it was the commencement of the fair-week, and the town was so thronged with people that photography was quite out of the question. I congratulated myself therefore on having taken half-a-dozen good negatives while the town was, comparatively speaking, quiet, and went on to Tours. The Cathedral is one of the finest in the world, but the distance from which you can get from it, with the camera, is too short to allow you to get much more than its fine west door and window, the lamps which hang suspended in the air, by means of chains fastened to poles on each side of the street, spoil any picture when an artist's license, (such as no photographer can take out) cannot be used. I noticed a window in a house from which I thought a good and entire view of the west front might be obtained. The house had a garden before it, with a wall, at the top of which was a lamp which might have interfered with the view. I called on the gentleman who lived in it, and requested that he would allow me to take a picture from one of his windows but was most ungraciously denied, the reason alleged being that so many similar requests had been made, and the view so good, that he was obliged to say *No*, to every one who asked him. In return I sent my compliments to him and said that should he ever turn photographer I wished that he would never meet with such a refusal, and that it was very unlikely that he would do so. He so far relented as to say "if I would call next day (Sunday) with my camera, he would consider and see what could be done," to which message I vouchsafed no answer.

This is the only instance of incivility I have as yet met with, or indeed heard of, as occurring in France. The very sight of the camera in many places calls forth kindly feelings and attentions, and frequently I have been asked while taking pictures whether I have been to such and such a part of the town, that there was a beautiful view elsewhere, and that if I did not know the way they would take me there and find me a window and a dark room, for they all seem so far to understand our "black art" as to know that the latter of these things is required; even the beggar boys offer their services (and a merry cheerful set they are) without any appearance of interested motives, and in one or two places have proved most useful companions, taking upon themselves the airs of a commander-in-chief and ordering off any one, (no matter who), from approaching the front of the camera, or even walking before it at a distance, and only as a special mark of favour allowing them to pass behind it. The camera excites more curiosity in this country than in ours, but the French crowd are a better set than the same class in England, and you can do anything with them but shake them off. I next took negatives of the towers of St. Martin and Charlemagne, which are the only remains of a vast cathedral, dedicated to the Saint whose name the first of these towers still retains. From Tours I went to Portiers with four pieces of sensitized paper in the dark slides of my camera. It was market day, and the streets very crowded; the cathedral was under repair, and the only part of it worth taking was one mass of scaffolding. I was only able to get two views of the church of Notre Dame, which presents a remarkable example of the florid romanesque style in its west facade, which is nearly covered with sculpture from top to bottom; having finished this I went on to Angoulême, when I exposed the two remaining pieces of paper, the following working, getting two good views of the tower of the cathedral and the approach to it, and then on to Bordeaux. Here the weather was so cloudy and the atmosphere so thick and hazy that I attempted nothing in the way of photography, though the place is full of subjects and would nearly repay a fornight's hard work with the camera. In fact had the weather been fine I doubt whether I should have been able to take any good pictures of those objects which are most worth seeing, as the spirit of church restoration is so fast progressing that these buildings present little else to the eye than masses of scaffolding. From Bordeaux you pass through a

most wretched and uninteresting looking country to Bayonne, where there is nothing to see. I went to Biaritz, with the idea of staying there a week, but found a stay of two hours quite sufficient. I had heard so much of this place and the fineness of the coast scenery that I was greatly disappointed to find there was nothing worth seeing with the exception of a grand view of the distant Pyrenees (too far off however to make a photographic picture); the coast is flat, the rocks being only a few feet high, others of them that the sea has surrounded are grotesque in shape and form, the coast of Jersey is infinitely superior to any part near Biaritz, and were it not that an Empress has chosen it as her occasional residence, one may be quite sure that its name would never have been so widely known as it now is. The next evening I was glad to find myself in Pau, where after taking rooms, &c., in some measure settled down for a time, wandered forth once more with my camera. The Pyrenees are too far off to give a good picture, and the only objects worth taking can be finished in a few days. I have taken them all, and for nothing better to do, am taking them all again on paper differently prepared, so as to test the capabilities of it more fairly. I am now longing for such weather as will permit me to get among the mountains.

In no part of any country in which I have been, is there such a fine light, with soft broad shadows, as in this part of France. The stillness of the atmosphere is extraordinary, as some negatives I have taken, in the room and elsewhere, of Lombardy poplar trees very clearly indicate. You might I think examine them with a microscope without detecting that there had been any movement among the finest and most delicate branches of these elegant trees. The sun is so bright and warm (and this is the last week in December), that while basking in it on the river side, one is induced to envy the numerous people you see up to their waists, in it collecting of stones.

Great as is the trouble and annoyance of working collodion, when you have the certain prospect before you of breaking the negatives, still the charming subjects which collodion alone can take, have induced me to send to Paris for a supply of it. Should I be able to get some good negatives I shall print a number from them before leaving this place. The costumes—the oxen in the carts, their picturesque drivers, &c., would draw forth the pencil or the brush of any one who had an idea of art, how much more does it induce the photographer to bring his camera to bear on such objects, of which there have, as yet, been so few taken.

I fear I have trespassed very sadly on the space usually allowed to Correspondents in your valuable Journal. I have said a great deal about the process I work, and other matter, which I shall not have to repeat when I next write to you. Whether my letter will be much shorter must depend upon what I see and where I go. I trust to be able to take my camera to places as yet untrodden by the photographer, and to show you, on my return, that a paper process will give as much finish, and more artistic effect for landscape portraiture, than glass.

T. Melville Raven.

Maison Belle-vue, Pau.

☞ *The Communications of Rayner Howell, J. W. Gutch, "Delta," J. Hancock, C. S., "Photogram," T. Gulliver, J. D. Waymouth, Mr. O'Toole, "Outlook," J. L., Gabriel Davis, D. L. F., "Photo," and J. F., will receive attention in our next.*

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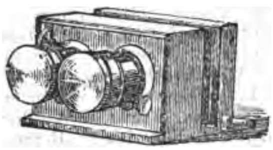

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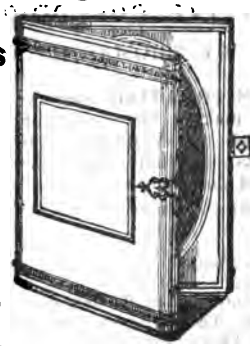

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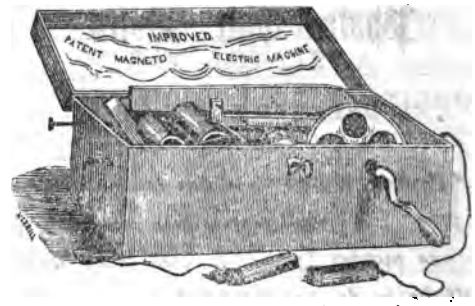

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Photographic Notes.

FEBRUARY 15, 1858.

**** Nos. 42 and 43 of this Journal are out of print. We shall reprint them immediately, in one number* (price 7d. post free), *which will be ready on the 22nd instant. The opportunity will be taken of uniting the two parts of Mr. Brown's article, and of adding the two Patents for November and December, 1857, to the former list, so as to render it complete. This reprinted copy of Nos. 42 & 43 will be an improvement on the original numbers for the bound volume.*

In our last number we endeavoured to direct especial attention to the circumstance of a remarkable photograph having been lately produced by M. Baldus, on one plate, and at one operation, which includes an angular field of view of more than 100°, and contains numerous figures, &c., the picture being equally sharp, and equally illuminated in every part, and free from the distortion common to photographs produced in the ordinary way, where very oblique pencils are introduced. We then stated that this picture had been taken in a panoramic camera, the invention of M. Garilla, in which the lens is turned towards the various objects of the view in succession, while the plate partakes of a corresponding movement, which brings the proper part of it always directly opposite to the centre of the lens, so that a panoramic view can be taken on a flat glass plate, with the same accuracy as on a cylindrical surface.

All this was stated on the authority of M. Gaudin, and there is not the slightest doubt of its accuracy.

But the matter appeared so extremely interesting that to wait patiently for the further particulars of M. Garilla's invention was simply impossible; so we set to work to see if we could, in our own way, invent an apparatus which should fulfil the same conditions as that used by M. Baldus.

Our idea of how a panoramic camera might be constructed was roughly sketched in the last number, and a promise given to illustrate it more completely, with the aid of diagrams, in the present. This we shall now endeavour to do. The diagrams will be found overleaf, and, with the help of an occasional reference to them, we hope to be able to explain fully our proposed form of apparatus.

A few words first on the optical theory of the instrument.

Let us suppose a common view-lens, with a stop in front, placed, with its axis horizontal, in the centre of a vertical cylindrical focusing screen; and a vertical axis passing through that centre about which the lens can revolve freely, its own axis always sweeping over the same horizontal plane. Suppose also, for the sake of argument, that the cylindrical focusing screen is incomplete, and only contains one third part of an entire cylinder. The lens can now be made to turn through an angle of 120°, and the images of all objects within that angular field of view, laterally, and the usual angular field vertically, viz., about 35°, can be thrown upon the screen. The question then becomes, would this arrangement produce on the screen, supposed to be sensitive to luminous impressions, an infinite number of overlapping incoincident images, or one tolerably distinct picture of the objects, in correct panoramic perspective?

To decide this point, let A, B, C, D, be objects situated at an angular distance of about 10° apart, at the lens, and let the axis be first presented towards a vertical line passing through B; images a, b, c, of the objects A, B, C, will then be formed on the focusing screen. Next let it be turned towards a vertical line passing through C; images b, c, d will then be formed on the screen of the objects B, C, D. The question is, will this second image, b′ of B, coincide with the first image b of B; and so on with respect to the other images? The answer is, they WILL very approximately coincide, and the narrower the instantaneous horizontal field of view of the lens may be, and the less the angular distance between the objects included by one position of the lens, the nearer the different images of the same object will approach to actual coincidence. So that by sufficiently narrowing the instantaneous angular field of view of the lens, the optical defects of incoincident images may be rendered *practically* inappreciable, and a sharp panoramic picture produced, by causing the lens to sweep over the angular field of view.

The possibility therefore of producing a sharp panoramic view by a revolving lens, sufficiently narrowed with respect to the horizontal dimensions of the picture it gives

in any instantaneous position, is demonstrated on sound optical principles, and it only remains to show how these principles may be applied practically.

But the moment we pass from theory to practice, mechanical difficulties are introduced which it is not always possible to foresee. In the present case, the panoramic camera which we are about to describe must be considered purely as a suggestion for a form of apparatus which, when made, may fulfil but imperfectly the hopes we have of it. At present it exists only on paper, but we are about to have one made, and shall take the earliest opportunity of stating how it works, and in what particulars it may be improved.

When it is required to take a view on paper including a much wider field than the usual 35°, we have only to substitute a cylindrical sheet of glass for the more complicated moveable piece of apparatus about to be described, and lay the sensitive paper against the convex side of it. This matter appears to be so simple that at present we shall not occupy space with further suggestions respecting it.

As it would be extremely difficult, if not impossible, to take panoramic negatives on the concave side of collodionized cylindrical glass plates, and then to print from the same, our object has been to devise the means by which a picture, including a tolerably wide angular field, may be taken on a long flat glass plate, to which such a movement is communicated during the exposure as that the printed positive, when laid against a cardboard cylinder of the proper radius, may be correct in its lines, and satisfy the rules of panoramic perspective. The way in which we propose to accomplish this, will now be described with the help of the diagrams.

The diagrams are not lettered, and we must trust to the intelligence of our readers to make them out without lengthy verbal description. We trust they will in a great measure explain themselves.

Fig. 1 is a plan and Fig. 2 a section of the apparatus. By comparing the focal length of the lens with the length of the slide it will be seen that in a camera, made according to the proportions of the figure, a picture could be taken including a horizontal angular field of about 70°, and a vertical angular field of about 35°. Supposing the lens to be 15 ins. focus, the picture would cover a plate about 20 ins. long by 10 ins. wide. The camera would be about 30 ins. wide, and the entire length of the apparatus nearly 3 feet. The dark slide moves so as always to touch two hoops, one at the bottom the other at the top of the camera, as shewn by the circle in the plan and the black marks in the section. At the bottom of each end of the slide a small wheel is inserted, as shown on the plan; this wheel runs in a groove at the bottom of the camera, and serves to steady the slide while travelling from end to end of the hoops. The paths described by these wheels are the evolutes of the circular hoops.

Now we turn to the long tube which carries the lens, and which revolves about two pins, working in sockets in the top and bottom of the camera, immediately over the lens. This tube is about 30 ins. long, 5 ins. wide, and 11 ins. deep. As it moves about its axis, (which passes through the centres of the hoops) its top and bottom press against the top and bottom of the camera, the top passing *over* the upper hoop and *under* the bottom hoop. The top and bottom of the revolving tube are continued beyond the slide, and a vertical roller (shown by a circle in the plan, and a shaded cylinder in the section) is inserted between them, so as to press tightly against the back of the dark slide and keep it always in close contact with the hoops.

The sides of the revolving tube have folding doors at their inner extremities, next the picture, which permit of being opened more or less, according to the degree of distinctness required in the picture; a narrow vertical band of which is in this way presented to the lens.

The space between the tube and the open end of the camera is covered loosely with black cloth, impervious to light.

The tube is lengthened in front of the lens in order to cut off diffused light. At the end, in front, is a narrow vertical opening from top to bottom, which may be closed by a sliding shutter. At the side of the tube is a little door through which the hand may be inserted when focusing with the lens.

The lens is mounted on a slider, which can be raised or lowered in the ordinary way, so as to give more or less sky or foreground, at pleasure. If a view lens, with a stop in front, the glass should be covered with pieces of black paper, so as only to leave a central vertical band open, a little wider than the stop.

Everything is now described but the dark slide, the mode of inserting it in its place, and of opening and closing the shutter.

The front shutter must be pulled out from the end of the slide, exactly like the lid of a box, and the end of it must project a few inches beyond the slide. The back of the

THE PANORAMIC CAMERA.

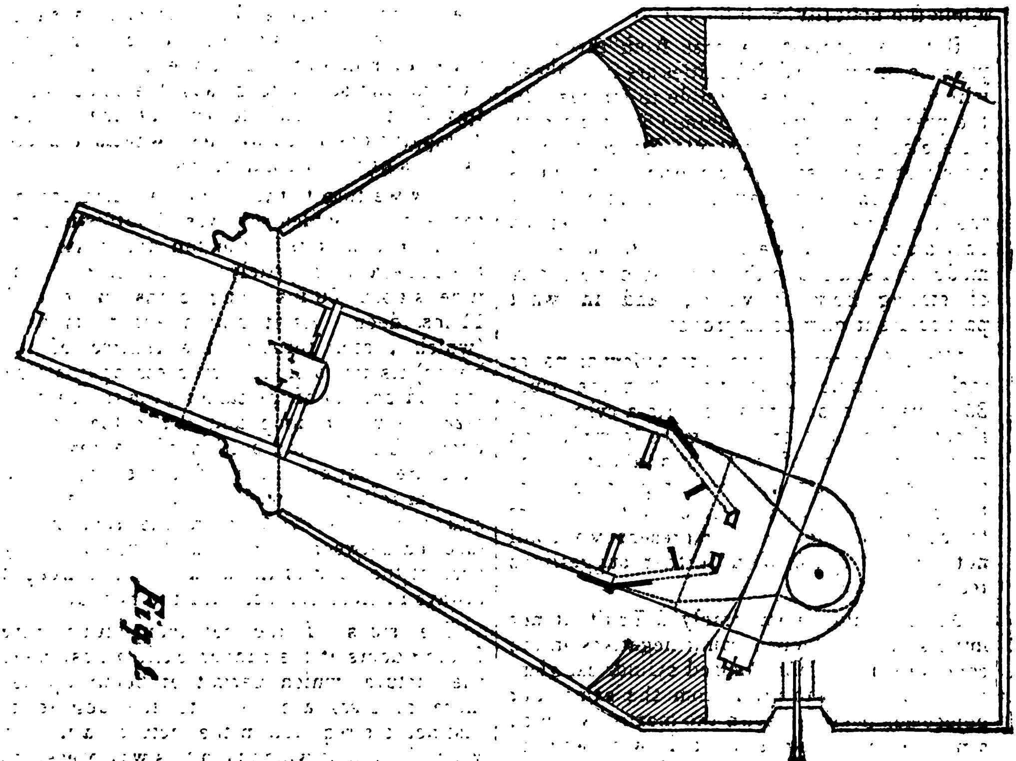


Fig. 1

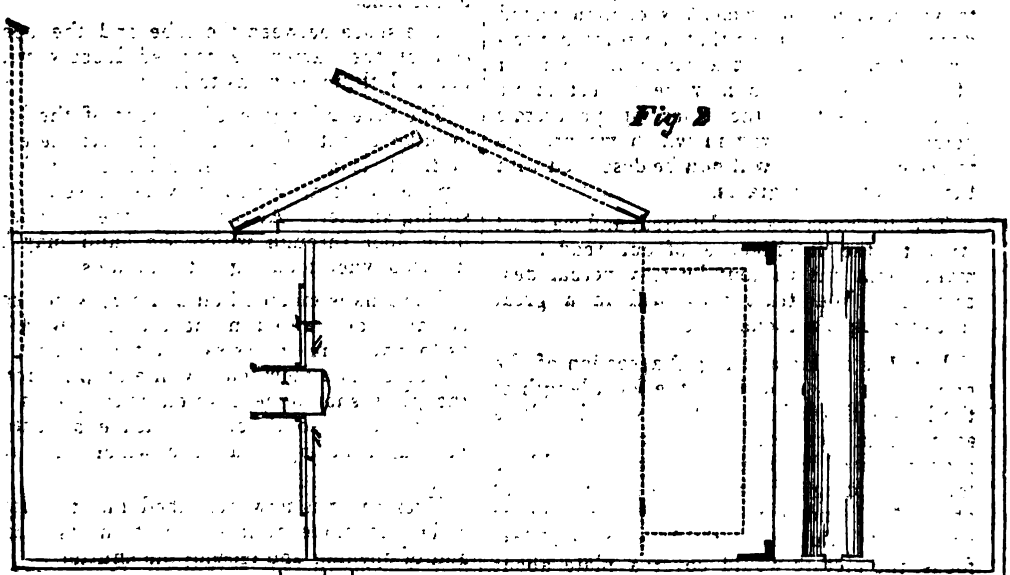


Fig. 2

There are some dotted lines in *Fig.* 1, and also some fancy-work in the right-hand side of the camera, which the reader need not, at present, pay any attention to. The broad belt of striped lines in *Fig.* 1 is intended to represent the upper part of the top hoop, but this belt is rather too wide, as compared with the section.

slide need not open. The plate should be put in in front, and laid either with the film or the back outwards, as occasion may require. When the pictures are intended to be viewed in a novel kind of reflecting stereoscope, which will be described on a future occasion, the back of the plate must be presented to the lens. Some contrivance for fixing the plate in its place may be easily introduced. It should rest on silver wires at the corners.

The slide must be inserted in its place from the back of the camera, which must be made to open for the purpose. The tube must be put into its extreme position on one side, and the end of the slide inserted between the roller and the hoops, the little wheels being then lowered into the grooves made to receive them. A piece of pasteboard should then be inserted between the back of the slide and the roller in order to increase the pressure. The tube may now be turned, and the slide, still closed, made to revolve against the hoops.

It now only remains to shut the back of the camera, remove the shutter from the slide, and the cap from the lens.

The mode of withdrawing the shutter, and inserting it again, has puzzled us more than any other part of the apparatus. A variety of plans may be adopted, in which black bags and arm-bags are introduced, but these we have discarded as objectionable, as we entertain a strong prejudice against black bags and sleeves. When the diagrams were sent to the engraver, we had a plan for removing the shutter from the side of the camera, as shewn in the figure, and inserting the slide from the top, which opened for the purpose. Since this, however, a better plan has occurred to us, which we cannot easily describe without a diagram, and which may be deferred for the present.

Let us now suppose that all is ready for taking a picture,—the shutter withdrawn, the cap removed from the lens, and the tube in its extreme lateral position.

The operator stands by the projecting end of it, and turns it very slowly and gradually round towards the opposite side of the camera; the whole time occupied in the exposure being determined partly by the size of the stop of the lens, and partly by the space between the folding doors of the tube. This done, the cap is put on the lens, and the shutter into the dark slide, which is then taken to the dark room, or van, or tent, to be developed in the ordinary way.

We have now described our panoramic camera, and its intended mode of action. If it be found to answer, and to give sharp pictures, a great step will certainly be made in out-of-door photography, but we are not very sanguine about it, and cannot help fearing that many difficulties may be likely to occur in the use of such an instrument. As for trouble or expense, these must not be allowed to weigh for a moment with any photographer who wishes to produce anything really grand and remarkable in his art. The difficulties are not such as would come under the head of trouble or expense, but such as would be likely to occur in the use of a moving piece of apparatus, any little defect in the adjustments of which might ruin the picture.

The great object we have in view in giving the order for this new camera, is to take a wide expanse of western skies, from a spot on the west coast of Jersey, where we think of rigging out a wooden house this next summer and aiming at a few novelties in a branch of photography which has for us peculiar interest. Our favorite ramble is on the wild shore of St. Ouen's Bay, in the afternoon, with nothing between us and the continent of America but the Atlantic ocean; and in this desolate spot, backed by sand hills, and inhabited only by vraickers, we hope to be able this year to photograph some of the magnificient skies which are frequently to be seen there, but which would lose all their pictorial interest if too small an angle were included in the photograph. In such subjects a trifling loss of definition, should it be found unavoidable in using the revolving tube and slide, would hardly be perceived, and the gain in other respects would compensate for it a thousand-fold. We have lately devoted some little attention to the subject of taking skies, and succeeded a short time since in getting a negative of the sun's disc, surrounded with clouds tipped with light.

The following is a translation of a letter from M. Voightlander to M. Lacan, on the subject of M. Petzval's new lens :—

"I have seen an article in *La Lumière*, of November 14th, 1857, in which it is stated that M. Petzval, of Vienna, has invented and constructed a new lens for photography.

"Having, by chance, obtained one of these instruments, I perceived immediately that this so-called new lens is no other than one which I constructed seventeen years ago, according to the formula of Professor Petzval, at the same time that I brought out my well-known double lens, the success of which has been sufficiently established.

"I have therefore addressed to the Academy of Vienna a memorial, in which I have proved that the lens in question is not based on any new principle, nor on any other curves than those which I adopted seventeen years ago on M. Petzval's calculations, and the formulæ of which are still in my possession.

"My object in writing you this letter is simply to state that this instrument is not new, and that my appeal to the Academy of Vienna is for the purpose of establishing my right to it. I have sent, at the same time, to the Academy, four of these lenses, corresponding to the dimensions of my double lenses.

"I have also sent four of these lenses to my Paris correspondent, M. Delahaye,* who will be happy to give you all particulars with respect to them.

"As for the camera alluded to in your Journal, the arrangement is no doubt very ingenious, like everything else invented by M. Petzval, but I do not understand why so complicated a camera is necessary, since very fine results can be obtained with the lens in question, mounted in an ordinary camera.

(Signed) "VOIGHTLANDER,
"of Vienna and Brunswick."

Messrs. Knight & Co., advertise a new lens, by M. Voightlander, entitled the "Orthoscopic Lens." We have sent for one of these instruments for the purpose of trying it, and reporting results. We shall take some negatives with it, and forward them to Messrs. Knight for the inspection of the curious. It appears, from the prospectus received, that the front lens is larger than the back one, the instrument resembling an opera glass, and the oblique pencils passing excentrically through the front lens, and centrically through the back lens, against which the stop is placed. This arrangement appears to us to be a very extraordinary one, and not at all calculated to give a flat field; but that matter will easily be determined by experiment. The Orthoscopic Lens is said to cover a very wide field in proportion to its equivalent focus.

The Solar Camera, described in our last number, is not the invention of Messrs. Anthony of New York, but of an American gentleman named WOODWARD, the Messrs. Anthony being only agents for the sale of it. We have received from them a "Bulletin of Photographic Improvements and Inventions," giving some additional particulars of the instrument (which were scarcely worth copying), and among the letters of various artists who have tried it, there is one from a gentleman in whose opinion we have great faith, in which he speaks very highly of it. Mr. Atkinson, of Liverpool, informs us that he has ordered some of these Solar Cameras, and we have begged of him to send one on trial.

As the subject of artificial lights is now assuming importance among photographers, the following recipes for different-coloured fires will no doubt interest many of our readers, as well as their juvenile friends. We must add a word of caution against the careless use of these dangerous compounds, some of which have been known *to take fire spontaneously!* The recipes are from Dr. Redwood's Supplement to the Pharmacopœia.

WHITE FIRE....	Nitre..................	46½	parts
	Sulphur	23	"
	Gunpowder	12¼	"
	Zinc Powder.........	18	"
LILAC FIRE	Chlorate of Potass..	49	parts
	Sulphur...............	25	"
	Dry Chalk............	20	"
	Black oxide of Copper	6	"
PURPLE FIRE...	Chlorate of Potass..	42	parts
	Nitre—Sulphur ...	22	"
	Black oxide of Copper.	10	"
	Sulphide of Mercury	2¼	"
BLUE FIRE......	Nitre..................	5	parts
	Sulphur	2	"
	Metallic Antimony.	1	part.
RED FIRE	Nitrate of Strontia.	72	parts
	Sulphur...............	20	"
	Gunpowder	6	"
	Coal Dust	2	"
CRIMSON FIRE..	Chlorate of Potass..	4¼	"
	Nitrate of Strontia.	67½	"
	Charcoal	5¼	"
	Sulphur	22½	"
GREEN FIRE ...	Nitrate of Baryta...	62½	parts
	Sulphur	10½	"
	Chlorate of Potass..	23¾	"
YELLOW FIRE...	Charcoal .... / Sulphide of Arsenic	1¾	parts
	Nitrate of Soda......	74¼	"
	Sulphur	19½	"
	Charcoal	6	"

We have received for insertion an interesting paper from Mr. Gutch, author of the Literary and Scientific Almanac for 1858), entitled "Jottings and Recollections of a Photographic Tour through various parts of England and Scotland, during the years '56 and '57." This communication will be inserted in our next. Some photographs which accompanied it are remarkably fine; the negatives were taken on wet collodion, in an "Archer's camera."

* The address of M. N. B. Delahaye, is No. 15, Rue de Lancry, Paris. [ED. P. N.]

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, January 26th, 1858.

MR. J. O. C. PHILLIPS in the Chair.

The minutes of the last Meeting having been read over and passed, some discussion took place on some business of the Society, and the CHAIRMAN then called upon Mr. T. MORRIS to read his paper, and show the manipulation of

BARNES'S DRY COLLODION PROCESS.

"As I have nothing new of my own to lay before you this evening, it is my intention, in common justice to our author, to allow him to speak in his own language, whilst we endeavour to illustrate his process experimentally. Indeed I feel more anxious to do so as I hear from so many quarters that the process is a failure and unworkable, but these assertions can only have arisen from want of care in manipulation, or a want of honesty in giving it a fair trial. Like all other Photographic processes, it requires care and cleanliness. I may observe here that I have no more interest in the process of Mr. Barnes than any other process. On the publication of the first edition of his work, and some of his pictures, I was pleased with them, and satisfied, if they were produced by Dry Collodion, that the process was well worth the learning. I immediately tried it, and partially succeeded. I afterwards made Mr. Barnes' acquaintance; I found him a very straightforward communicative man, and an ardent lover of the art. Some of his pictures stand alone I believe at the present time. Our object however this evening is not to extol Mr. Barnes, or his pictures, or to interfere with the angry feelings that have arisen in some quarters, but to show you the *modus operandi*, as practised by him, and as faithfully given in the second edition of his Dry Collodion Process. We will, however, by your kind permission, read his preface, and save ourselves any further argument on the question, from which we shall turn to the more pleasing task of preparing a plate and obtaining a picture according to the directions contained in his little but good shilling's-worth.

Mr. Morris then read the preface to the second edition of Barnes' Dry Collodion Process, and then exhibited several pictures obtained by the process. He then proceeded to prepare several plates in the manner detailed in Mr. Barnes' pamphlet; first, with plain collodion only, and afterwards with albumen, as a support for the collodion. He then excited, washed, and dried the plate in Mr. B's ingenious drying box, and exposed and printed two stereoscopic pictures by gas-light. The simple and rapid method of procuring a limpid solution of albumen was very much admired. To make this, Mr. Morris took the whites of two eggs, making two ounces of albumen, and four ounces of distilled water, and after stirring these with a glass rod, for half-a-minute, he added about 30 drops of glacial acetic acid; upon stirring the mixture it becomes quite limpid; it is then filtered several times through ordinary filtering paper (the same piece should be used throughout, as the first filtration carries with it all the outside fibres of the filter), consequently by re-filtration, a clear solution is obtained; this is poured upon the plate-like collodion, and dried in the stove. The plate is then coated with collodion, excited, washed and dried in the ordinary way.

Mr. Morris then proceeded:—It is absolutely necessary to have the plates perfectly clean, the slightest particle of grease destroying the adhesion betwixt the glass and the albumen. I shall now expose these plates, one for twelve, the other for fifteen minutes, to the light of this argand gas burner. They are placed, as you see, in ordinary small pressure frames, and a negative placed in front.

The exposure being now completed, I shall at once proceed to develop the pictures. For this purpose I use a mixture of pyro-gallic acid and gallic acid, made thus,—

Saturated Solution Gallic Acid ...	4 ozs.
Distilled Water ...	4 ozs.
Pyro-Gallic Acid ...	4 grs.
Acetic Acid ...	1 drm.

The plate is first dipped in the washing bath, then the above mixture is poured on and off several times. I then mix a few drops of a thirty-grain solution of nitrate of silver. The development will sometimes occupy a long time, but in this case probably we shall not be long.

[The two pictures took about twenty minutes in development, and were tolerably successful.]

I may here add that the chief use of the albumen appears to be to hold the collodion firmly on the plate; for instance, if you use a tough collodion, which will give an intense development on plain glass only, it will not unfrequently slip off the glass. Now the collodion seems to enter into combination with the albumen, and it will then bear a considerable amount of hard washing. The object of sometimes coating the surface of the film with albumen, is to preserve it from injury—the plates may then be carried in contact. After detailing other experiments, for which we must refer our readers to the pamphlet in question, Mr. Morris said, I have now endeavoured, as briefly as possible, to give you the manipulations of this interesting process, and I can only add that it requires to be known to be admired and practised. (Cheers).

MR. OSBORN.—Although we must feel very grateful to Mr. Morris for the trouble he has taken, and the skill he has displayed this evening in demonstrating the Dry Process, for our special edification and amusement, I cannot allow the present opportunity to pass without another endeavour to place matters in their true light before you. Mr. Morris has read you the preface to Mr. Barnes' work, and without feeling any ill-will whatever to Mr. B. I must say that I consider his remarks and reflections upon Dr. Hill Norris unwarranted and uncalled-for. So far from Dr. Norris's process being a copy of Mr. Barnes's,

I contend that they are unlike in every respect, except in being dry. Let each take the honour due to him as an independent discoverer, and the public will recognize their claims. I *proved* on a former occasion, however, that Dr. Norris's process could not be a copy of the other, inasmuch as the Doctor published his first letter thirteen months prior to the issue of Mr. Barnes's pamphlet, and the letter containing his last improvements is dated May 6th, 1856, whereas Mr. Barnes's first edition bears date May, 1856. How can one be a copy of the other? With regard to the process we have seen manipulated to-night, I must say it appears to be too complicated and tedious for the amateur, and there are many things used of which I scarcely see the utility, such as camphor, which inevitably spoils the bath for the Wet Process, the acetic naptha, and others. I never had the curiosity to try the process, as I am perfectly satisfied with the one I have used (Dr. Norris's), the results from which are all that could be desired; and moreover, its great beauty is its extreme simplicity and the absence of all the paraphernalia which is so annoying to an amateur, at the same time it is almost certain in its results.

MR. JOHNSTONE.—I quite agree with Mr. Osborn. The main requisite to be sought for in any process, dry or wet, is simplicity. It appears to me that the process we have just seen is somewhat empirical, and that Mr. Barnes has introduced a variety of substances into his collodion, which if not absolutely injurious, are yet quite useless, and for which he cannot give any sound reason. Now it appears that he has so far stretched the process as to fall back upon albumen as a support for the collodion. This is not new. Fox Talbot suggested it long since; and besides, if you are to complicate the process why not at once use the collodio-albumen, which is undoubtedly the most scientifically correct of any similar process now out. Albumen doubtless amalgamates with the collodion, and prevents its splitting or washing off, but if you use a proper condition of collodion, you may dispense with the albumen. Referring however to collodio-albumen again, there is rather a remarkable phenomenon connected with it. While wet you may wipe off the whole of the image from the surface of the albumen, thus showing that the image is ON the surface, and not IN the body of the combined films. Many persons would ask, therefore, what is the use of the under stratum of collodion, &c.? In my opinion its greatest use is during the development of the image, as it is a sort of reservoir of latent force, which keeps up local action in all parts of the plate.

The CHAIRMAN. How long will the plates keep?

MR. MORRIS. I believe, if properly prepared, there is no limit to their keeping qualities.

A MEMBER. But after exposure, as many plates will not keep long after exposure?

MR. MORRIS. I am not prepared to say how long; but I have kept them a fortnight.

MR. OSBORN. You will doubtless recollect the plate I exhibited at a previous meeting, kept a month before and a month after exposure, by Norris's process.

MR. HART. It was a very satisfactory proof of the capabilities of the process.

MR. JOHNSTONE. Plates by almost any dry or syrup process will keep well before exposure, but many fail afterwards, getting feebler according to the length of time that elapses between exposure and development. Now in Norris's process, owing to the total absence of free nitrate of silver, the plates will keep an indefinite time.

MR. OSBORN. I think the presence of acetic acid in the film of some of the dry and moist processes has a great tendency to weaken the image after exposure.

After some further conversation, the Meeting closed, with a vote of thanks to Mr. Morris for his able and interesting paper and experiments.

The next Meeting will take place on February 23rd, when Mr. J. O. C. Phillips will read a Paper on "Photography at Night," illustrated.

LIST OF PHOTOGRAPHIC PATENTS, FOR THE YEARS 1856 AND 1857.

(CONCLUDED FROM NO. 43).

November 3rd, 1857.

No. 2792.—HENRY HINSMAN SWEET, of Northumberland Street, Strand, London. "Improvements in Photographic portraits and pictures."

December 12th, 1857.

No. 2066.—CHARLES COWPER, of 20, Southampton Buildings, Chancery Lane, London, Patent Agent. "Improvements in photography."

STEREOSCOPES AND CAMERAS.

May 24th, 1856.

No. 1245.—ADAM DUKIN JUNDZILL, Civil Engineer, Portugal Street, Lincoln's Inn Field's, Middlesex. "An instrument for animating stereoscopic figures."—Not completed.

July 26th, 1856.

No. 1782.—GEORGE COLLETON COOKE, of George Yard, Lombard Street, City of London. "Improvements in Stereoscopes."—Completed.

August 19th, 1856.

No. 1935.—EDWIN SUTTON, of Regent Street, Middlesex, Optician and Photographic Artist. "An improved construction of Stereoscope."—Not completed.

August 23rd, 1856.

No. 1965.—PHILIPPE BENOIST, of Rue de Lancry, Paris, France. "An improvement in the construction of Stereoscopes."—Not completed.

October 23rd, 1856.

No. 2486.—GEORGE EDWARD JOHNS, of Falcon Square, in the City of London, Middlesex, Box Manufacturer. "The application and adaptation of an optical or stereoscopic arrangement in the manufacture of boxes."—Completed.

November 3rd, 1856.

No. 2578.—Samuel Middleton, of 15, Porter Street, Newport Market, Middlesex. "Improvements in the manufacture of certain articles of leather without seams."—Completed.

Ditto.

No. 2581.—Ebenezer Erskine Scott, of Dundee. "Improvements in Stereoscopes."—Completed.

December 9th, 1856.

No. 2914.—John Browning, of 111, Minories, London, Philosophical Instrument maker. "Improvements in Stereoscopes."—Not completed.

December 19th, 1856.

No. 3009.—Charles Massi, of 13, Greville Street, Hatton Garden. "Improvements in apparatus for mounting cameras."—Not completed.

January 1st, 1857.

No. 11.—William Henry Phillips, of Essex Street Strand. "Improvements in Stereoscopes."

January 20th, 1857.

No. 168.—Richard Quin, of Poland Street, Middlesex, Jewellery and Photographic Case Maker. "Improvements in Stereoscopes."

February 9th, 1857.

No. 374.—Thomas John Taylor, of Seckford Street, Clerkenwell, Middlesex, Jewel Case Maker. "An improved construction of Stereoscope."

June 3rd, 1857.

No. 1558.—Paul Emile Chappuis, of Fleet Street, London, Patent Reflector Manufacturer. "Improvements in Stereoscopes."

June 6th, 1857.

No. 1595.—Henry Joseph Noé, of Paris, France, Frame Maker. "Improvements in portable Stereoscopes."

July 30th, 1857.

No. 2078.—Henry Bauerrichter and Gustavus Gottgetreu, of Charterhouse Square, Middlesex, Manufacturers. "Improvements in the arrangement or adaptation of Stereoscopic apparatus, and in boxes or cases for containing the same."

September 4th, 1857.

No. 2312.—Prosper Bernaud Godet, of Paris, France. "Improvement in Stereoscopes."

Ditto.

No. 2315.—Jacques Alexandre Ferrier, of Paris, France. "Improvements in transparent Photographic pictures, and their application to Stereoscopes."*

* We shall give a copy of the Specification of this patent, in *extenso*, as soon as it can be had from the Patent Office, in March.

November 9th, 1857.

No. 2827.—Walter Hardie, of Pitt Street, Edinburgh, Printer. "An improved Stereoscope."

November 19th, 1857.

No. 2903.—Seth Gill, of Liverpool, Lancaster, Surgeon-Dentist, and Henry Newton, of Liverpool, aforesaid, Electro-Plater and Manufacturer of Photographic apparatus. "Improvements in obtaining Stereoscopic pictures."

November 24th, 1857.

No. 2940.—Charles Sands, of Felix Terrace, Liverpool Road, Middlesex, Licensed Victualler. "Improvements in Stereoscopes."

December 8th, 1857.

No. 3084.—Henry Pershouse, of Birmingham, Warwick, Engineer. "An improvement or improvements in Stereoscopes."

December 23rd, 1857.

No. 3148.—William Nunn, of Hackney, in the county of Middlesex, Gentleman. "Improvements in Stereoscopic apparatus."

SPECIFICATIONS.

PHOTOGRAPHY ON WOOD.

No. 1511.—WILLIAM EDWARD NEWTON, of 66, Chancery Lane, in the County of Middlesex, *Civil Engineer*.—"An improved method of applying Photography to the use of Engravers."—A communication from abroad.—*27th May*, 1857.

The patentee states in his specification that wood blocks have been covered with a pellicle of varnish to prepare them for receiving the collodion, and that collodion films have also been removed from the glass plates and floated on to the wood, but that neither plan has proved successful. The pellicle of varnish interferes with the operations of the graver.

The invention consists in using a *limpid* varnish, which soaks into the wood instead of forming a pellicle on the surface. One quart of asphaltum varnish is mixed with one gill of ether and one quarter of a pound of lamp black. This is rubbed into the surface of the wood with a piece of buckskin, or cloth. Two or three thin coatings are thus applied, so as to fill the pores of the wood without leaving a pellicle on the surface. The collodion is then poured on in the ordinary manner. Silver bath, of 45 grains to the ounce of water, is then applied. Exposed in the camera. Developed with a mixture of 2½ oz. sulphate of iron, 2½ oz. acetic acid, 2 quarts water, and 2½ oz. best alcohol. Fixed by solution of

2½ oz. cyanide of potassium in one quart of water. Washed in clean water. When dry, it is ready for the engraver.

The claim is for the compound of asphalte varnish, lamp-black and ether, when the same is applied to the block by rubbing it into its pores, as set forth.

No. 1883.—PETER HIPPOLYTE GUSTAVE BÉRARD, of 323, Rue St.-Denis, Paris. "Improvements in manufacturing azotic cotton, or pyroxile, for photographic and other purposes."—*7th July*, 1857.—Completed.

The Provisional Specification states, that half-a-pound of shearings of cotton, or the shearings of treble milled cotton, is to be mixed with two and a half pounds of nitre, or azotate of potash, powdered, and very dry. The mixture is made on a piece of oilcloth, or a sheet of paper, and is thrown into a glazed earthen jar, containing about five and a half pounds of concentrated sulphuric acid, and the whole well stirred together into a pasty mass, for from ten to twenty minutes. It is then well washed in water, pressed, and dried on cloths, or by any suitable means. It is then dissolved in ether, or in alcohol and ether, and distilled, and the cotton is thus obtained in a dry and soluble state. The advantage of the first process is stated to be this,—that by mixing the dry nitre with the cotton, a more regular and a more soluble cotton is obtained.

The Final Specification differs somewhat from the Provisional Specification as will be seen from the following extracts, marked by inverted commas :—

"The cotton which I use for my process is "that obtained from the shearing of swan "skins *(tontisse de molleton)*. I mix together "half-a-pound of sheared cotton, with two "pounds and six ounces of powdered saltpetre "or azotate of potash, in a very dry state. I "proceed in the following manner :—I take "two glass balloons, or large bottles, capable "of containing from two to two and a half "gallons, five pounds and five ounces of "concentrated sulphuric acid being poured "in one of the bottles, the powdered azotate "of potash is thrown into the same bottle, "which should be closed at once with its "stopper, and the vessel is shaken well for "about a half-a-minute, and the liquid is "then poured into the other bottle, which "contains the shearings of cotton. The "second bottle is also immediately closed. "The mixture forms a thick paste, which is "shaken several times in the course of about "six to ten minutes, which is the time "required for completing the operations, "according to the degree of temperature."

Filtered water is then poured into the bottle, and the whole is poured out into a large glazed earthen vessel containing some water. It is washed until the liquid does not affect blue litmus, and is then dried in a rotating apparatus, and afterwards, in a chamber heated by steam pipes. The azotic cotton is dissolved in ether, or a mixture of ether and alcohol, and any insoluble matter allowed to subside. The solution is drawn off and distilled so as to leave the dry soluble cotton.

"In a word, my invention consists in the "process before described, for obtaining a "new kind of product, and in the product "itself, either as powdered azotic cotton, or "the said dissolved and dried material, "forming a dry collodion, entirely soluble, "unalterable, and inexplosive, consequently "capable of being transported anywhere "without danger."

No. 1884.—PETER HIPPOLYTE GUSTAVE BÉRARD, of 323, Rue St. Denis, Paris.—"Improvements in manufacturing and applying concentrated collodion."—*7th July*, 1857. Completed.

This invention consists in dissolving azotic cotton in ether, by the aid of heat, the operation being performed in a distilling apparatus, so as to save the ether, which is volatilized, a larger quantity of cotton is thus dissolved, and the solution is thus effected nearly instantaneously. The distillation is continued until the collodion is concentrated to the required strength. After the cotton is dissolved, the solution may be allowed to cool and deposit the impurities, and the clear liquid is then drawn off and concentrated by distillation. By this process collodion may be obtained containing 60 per cent., and even more, of dissolved azotic cotton, whilst the collodion hitherto in use does not contain more than from six to seven per cent. and ordinary photographic collodion much less. The ether, which is distilled off and condensed, is used again, either alone or with a little alcohol.

To obtain a coloured collodion for artificial flowers, &c., the required mineral or vegetable colouring material is ground with an oily substance, more especially castor oil, or a volatile essence, and added in the still, and the concentration carried on to the required degree.

, *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ON TAKING CLOUDS WITH LANDSCAPES.

To the Editor of Photographic Notes.

SIR,—Many photographic pictures have a very cold, sombre and unartistic appearance, because they lack those beautiful representations of clouds, which add so much to good engravings; and this is especially noticeable in those landscapes which have a very distant, or a level horizon. This defect, I am happy to say, may be easily prevented by the very simple contrivance described below, which I invented last spring, but have been unable to use much, because my photographic pursuits have been in abeyance. To photograph clouds with the landscape, it is of course only necessary to "screen" the sky, until the last second of the "exposure" for the landscape, then lift up the screen, so as to catch the clouds instantaneously, and promptly close the lens. Now this "screening" (or shading), may be done either *inside* the camera, as the late Mr. Archer used to do with his very ingenious apparatus, or it may be done *outside*, as follows:—Take a piece of zinc, about as wide as the diameter of the lens, and twice as long, and clip one long side like a saw, so as to render it sharply serrated; then blacken it, to avoid any reflection of light on the lens, and make two small holes in it, for the purpose of attaching strings or wires near each end. The next thing is to erect a "gallows," or a sort of "ship's yard," over the top of the lens, and hang the zinc shade to it, in front, by both strings or wires, with the "teeth" downwards, and adjust these teeth so that their shadow *slightly* overlaps the horizon of the picture on the ground glass. During the exposure, this screen is to be kept vibrating sideways, close to the opening of the lens, until the last moment or so, and then lifted quickly up, and the cap put on the lens. The result is, that the clouds are beautifully represented, and the shading of the screen is so softened off at the edge, that it is *practically* imperceptible, and this is effected, not only by the serrated edge of the screen, but also by the *parallel* rising and falling, caused by its swinging from *two* supports. Other adaptions of this contrivance, I may leave to the ingenuity of your readers.

Nice. JOHN RAYNER HOVELL.

We think that the following might be a better plan, than that suggested by Mr. Hovell:—

First, use the slide with a plain glass in it, instead of the ground glass, and behind the plain glass put a sheet of tissue paper. Let this be the focusing screen, and trace the outline of the sky upon it, with a black lead pencil. Cut it out with a pair of scissors, and cut a piece of stout millboard to the same shape. Now place the millboard upright, at the bottom of the camera, close to the dark slide, and let there be a peg working through a hole at the bottom of the camera, with its end attached to the millboard. This being arranged, proceed to take the view, and during the exposure, displace the millboard up and down, and backwards and forwards a *very little*, until the last few seconds of the exposure; then let it fall down at the bottom of the camera, and allow the sky to produce its impression.

We have not tried the above plan, but think it likely, that with a little clever management, it might be found to answer. The lens should be a view-lens, with a small stop in front.

[ED. P. N.]

ON MICRO-PHOTOGRAPHY.

To the Editor of Photographic Notes.

DEAR SIR,—I am glad to find you are calling attention to the use of "the *right end* of the microscope," by photographers. It seems to me, that an instrument, brought to its present state of perfection, at great expense, time, and labour, for the purpose of unfolding to our sight the hidden beauties of the minute in nature, should be used in connection with photography for impressing its wondrous revelations on the sensitive medium, thus extending to thousands the instruction and delight of which the microscopist has at present an unwilling monopoly, rather than for locking up the beauties of the visible, whether in art or nature, on a slide 1 × 4, for the amusement of the curious.

The only good I can conceive to arise from these microscopic photographs, is the possibility of some being induced to purchase an instrument for their examination, and being led to become genuine microscopists from it.

There is one great desideratum at present, and that is, an artificial illuminator for night use—many of us having too little *daylight* at our disposal to do anything in this way.

During the bright spring mornings of the last three years, I have given a little attention to this matter, and hope this year to get some negatives of the beautiful microscopic forms which the marine aquarium enables the Londoner to keep ready by him for examination.

My microscope is connected with the camera by a cone of brass, the base of which screws into the ring into which the ordinary photographic lens fits; the apex is continued as a short tube, and slides into the upper end of the microscope body, the eye-piece being removed. We thus have the microscope in a horizontal position, and can focus the magnified image upon the ground-glass screen, which, if the object-glass be corrected for the purpose, gives the chemical as well as visual focus.

The enclosed prints are from negatives, taken by this arrangement. The object-glass used was a two-thirds-of-an-inch Smith & Beck's, the power being used, without the eye-piece, from 25 to 30 linear.

I think these prints will show that opticians have produced lenses well adapted for this purpose, and in more experienced hands than mine, the results would have been more satisfactory.

47, Mornington Road, Regent's Park. C. S.

—The prints forwarded by our correspondent are capital, with one exception only, the negatives appear to have been a *little* too dense and under-exposed. A circular field, 3½ ins. diameter, has been covered, sharp to the edges, and equally illuminated. Our idea of micro-photography by artificial light, is, that the oxy-calcium light would probably be the best to employ, and a double, or triple achromatic object-glass, not over corrected for the blue rays as at present, but properly achromatised for photographic purposes. It might be well also, with artificial light, to introduce a little bromide into the collodion, but this point requires further investigation. [Ed. P. N.]

ON COPYING SMALL PRINTS.

To the Editor of Photographic Notes.

Sir,—In your *Notes* of the 15th ult., I see your reply to "H. S's." inquiry as to the method of of getting nearly full-size copies of small prints. Having given some attention to find out a way of getting *full or enlarged-size* copies of small prints or photographs, I forward you the result :—

"With a piece of thick Cardboard, I make a funnel-shaped-frame, about five inches long, the narrow end of which I tie to the mouth of the lens, and at the broad end I fix a good magnifying glass, say four inches in diameter, with which additional apparatus I take full-size, or larger copies of prints, &c., without placing the lens so near to the picture as is necessarily the case in taking reduced copies without it."

I am not aware that any similar method has been adopted by others.

John D. Waymouth.

POSITIVE COLLODION PICTURES DIRECT ON PAPER.

The following is extracted from *Humphrey's American Journal* :—

"*To the Editor of Humphrey's Journal.*

"Sir,—In your Journal of December 15th, 1857, you inserted an article (copied from *Photographic Notes*) by Mr. B. Whitlock. I beg to state, that in 1856 I experimented with a process similar to the one given by Mr. W., but, on account of being unable to detach the finished picture from the plate, I threw aside the process as worthless. During last winter the thought occurred to me that the paper should be attached by the *margin* only, and herewith you receive three pictures taken by this means; also a plate, to fully explain the manner in which the paper is attached to the glass.

"The enclosed advertisement, I think, will be sufficient proof that my method for taking collodion pictures on paper was perfected before June, 1857.

"The following is the method I employ for taking positive collodion pictures on paper direct in the camera :—First, make a gum solution thus: gum arabic 1 oz., sugar 1 oz.; dissolve in water, so as to form a solution about the consistency of common varnish; clean as many glasses as you desire to prepare plates. The cleaning need not be so particular as if the picture were to be taken on the glass; use flat-faced paper the size of the glass. Having the above ready, I take a glass in the left hand, and, with a camel's-hair pencil dipped in the gum solution, I run a line (not more than ⅛ of an inch broad) around the margin of the glass; lay down the glass, take another and do it in the same way; and so on, until you have done about six glasses. By that time the first one that was gummed will be partly dry, so as to become *tacky*; in this state I lay a sheet of paper on the glass, and press from the centre to the edges; by this means I exclude all air, and the paper will lay perfectly flat on the glass. But be sure that the edge of the paper is firmly attached to the glass all around; if not so, when placed in the bath, the silver solution will penetrate between the glass and the paper. After preparing as many plates in this manner as I require, I then proceed to blacken the paper, which is attached to the glass, with the usual black varnish used to back positives; I prefer putting it on with a small paint-brush, for, by this means, the varnish can be used much thicker and will not penetrate through the paper, which would be the case if thin varnish were poured on in the same way as collodion. After giving the first coat let them stand until next day; then give a second, and, when perfectly dry, they can be used immediately or put away in boxes, and they will keep any length of time. Plates prepared as above need no cleaning, unless they have been handled, nor should they be rubbed with rotten-stone or other polishing material, but if they get soiled, by handling or any other cause, they can be cleaned with a little alcohol and cotton, care being taken not to rub them too hard; when clean, pour on the black paper positive collodion; place in the bath; expose in the camera as for a positive on glass; develop with proto-sulphate of iron solution, and fix with cyanide of potassium; wash well with water, and dry. When it becomes dry, gently warm the plate, and pour over the picture some of 'Humphrey's Collodion Gilding;' no other varnish will answer the purpose so well. I have tried several, and all either destroy the whites, or will soil by handling; not so with the Gilding, for as soon as dry (which will be in about two minutes) it will stand any amount of handling, in fact, the more it is rubbed with a soft handkerchief the brighter it becomes. The picture can now be separated from the glass, by running a sharp knife* inside of the gum-line,† which attaches the paper to the glass. The picture can then be mounted on a sheet of ornamental paper or cardboard, or they can be given to customers unmounted, in which condition they are, perhaps, the most convenient for transmission to friends.

"If there is anything you do not understand in the above description, please to write, and I will answer any question you may ask.

"Joseph Corns.

"Safe Harbour, Lan. C. Pa."

* I have enclosed a one sixth-size picture that has been laying about my work-room since last winter, and is one of the first pictures by the above method; I have cut three sides, so that you may fully understand how I detach the finished picture.

† Before using the gum solution I always put in a little indigo, so as to colour the solution; by this means I can more easily see the gum-line.

SUBSTITUTE FOR GROUND GLASS.

To the Editor of Photographic Notes.

Dear Sir,—Being in want of a focusing-glass a few days since to try a new camera, I hit upon the following expedient, which answers so well that I send it to you if you think it worth inserting:—It is simply to coat a plate of plain glass with collodion, and allow it to dry, then fix it in the focusing-frame, collodion-side next to lens.

Swansea. Thomas Gulliver.

—An iodized plate has been frequently used as a substitute for ground glass, but plain collodion, *if good*, is too transparent. Spirit varnish applied to a *cold* plate, answers very tolerably. [Ed. P. N.]

FUCH'S SOLUBLE GLASS.

To the Editor of Photographic Notes.

Sir,—I have perceived in your Journal a great seeming difficulty in procuring a protector for Positive Collodion Portraits. I happened to see the other day, in a chemical work, that anything immersed in what was termed "*Fuch's Soluble Glass*," would receive a glassy film, impenetrable to fire, and I suppose also, to water. It seems to me that (could it answer), the portrait being as it were encased on all sides by glass, would not suffer any change by atmospheric action.

I have never tried the experiment myself, so do not know whether it would succeed.

"Fueh's Soluble Glass" is thus made:—Take 15 parts pure sand; 10 parts carbonate of potass; and 1 of charcoal. Heat this together. Then, dissolve it in 4 parts of boiling water, and evaporate it to S.G. 1·24. It will then deposit, on surfaces to which it is applied, a glassy film, by spontaneous evaporation.

"Photogram."

ALBUMEN PRINTING PROCESS.

To the Editor of the Photographic Notes.

Dear Sir,—Your number of *Notes* for the 15th January, just come to hand, has induced me to write you anent some points or queries on printing positives on albumenized paper, to which method I frankly confess I have a great liking.

I may mention that I have toned my albumenized prints in a saturated solution of hypo-sulphate of soda and chloride of gold; and for greater permanence immersed them in a fresh solution of hypo-sulphate of soda, washing well, then immersing for half an hour in a solution of soda, ultimately allowing the print to lie for some hours in fresh water, which the tap keeps constantly changing, and now and then, during this period, dabbing the print on both sides well with clean water and sponge. Latterly, after keeping prints for a year or two, they have begun to spot here and there and shew signs of decay.

Mr. Hardwich recommends to remove the size from positive prints. I have done so, and find my pictures not more permanent, if even so good, as when I allowed the size to remain. I hope to learn in your next number your opinion as to the use of soda or ammonia in removing size, also what time, with sponge and water constantly changing, a print should lie in the water?

In your last number, pps. 31 & 32, you give an extract from the letter of a correspondent, who states "he has adopted a new style of printing which is scientifically correct, and gives most brilliant proofs, with pure whites, on albumen paper, the colour being nearly black, the picture is nearly all metallic gold or there can be no sulphur," &c.

May I, as one of many amateurs desirous of learning a really good mode of printing and fixing positive prints permanently on albumenized paper, solicit your correspondent to send his method of printing positives to you for insertion in the next number of the *Notes*.

"Delta."

Glasgow, January, 1858.

—We doubt whether the permanence of prints is likely to be increased by fixing and toning them in strong hypo. Strong hypo is much more easily rendered milky, and acts much more energetically in sulphurating a print, than weak hypo. According to our experience a print may be completely fixed in ten minutes in a fresh bath of one part of hypo to twenty parts of water, and we consider it injudicious to leave a print too long in hypo, particularly when the solution is strong and has been used before. The only legitimate use of hypo is to remove the chloride of silver; and when a print is left too long in a strong hypo bath it appears much more likely to fade than when a weaker bath is employed. The only silver printing processes which, according to our experience, can be depended on for permanence, are the development processes on iodide or chloride of silver, and the sun-printing process in which the print is first toned with sel d'or and afterwards fixed with weak and fresh hypo. In the common printing process which you have described permanence is the exception and fading the rule. Immersion in an alkaline bath, or in hot water, to remove the size, appears to be worse than useless, and so does *excessive* washing to remove the hypo. We wish we could conscientiously record any other opinion. [Ed. P. N.]

Errata in Mr. Raven's letter in No. 44.

Page 43, first column, line 42, for "it seems," read "in turns." Page 44, first column, line 25, for "as sure," read "at once;" line 36, for "then," read "them;" line 40, for "we," read "one;" line 62, for "when," read "where." Page 44, second column, line 9, for "I wished," read "I trusted;" line 12, for "next day," read "the next day;" line 44, for "Porteus," read "Poitiers;" line 55, for "working," read "morning;" line 61, for "nearly," read "richly." Page 45, first column, line 19, for "in some measure," read, "and having;" line 33, for "in the room," read "on the river." Page 45, second column, line 4, for "collecting of stones," read "collecting stones."

☞ *The letter of Barnard Proctor, and the Replies to Mr. O'Toole, Outlook, "J. L.," "J. L. F.," Gabriel Davis, "J. J.," Count Wengierski, R. Linsley, and others, will appear in our next.*

Photographic Notes.

MARCH 1, 1858.

SINCE we last had the pleasure of addressing our readers, we have paid a visit to the Exhibition of the Photographic Society, and called on most of the principal London Photographic firms to hear and see what was going on in Photography. The subject which at this moment appears most to interest the Trade is M. Petzval's new lens; and we have obtained some very valuable information with respect to this instrument from Mr. Ackland, who has just been to Vienna, and obtained full particulars of it from M. Petzval himself. The instrument is the same as that which Messrs. Knight advertise as the "Orthoscopic Lens" of Voightlander. We saw one of these lenses at Messrs. Knight's, and obtained full particulars of the construction of it from Mr. Ackland. These particulars we should immediately lay before our readers, were it not that Mr. Ackland has promised to send us a communication for the next number, in which he will himself state all that he has learnt about the matter. In the meantime we hope to receive one of these lenses from Messrs. Knight for trial, and as soon as it arrives we shall take some negatives with it, and return them, with the lens, for examination by anyone who may be interested in the matter. No patent has been taken out for the Orthoscopic Lens in England, and therefore any optician may copy the construction of it, and introduce it for sale, should it be found to answer; but it must be remembered that two lenses may be, *to all appearance*, identical, and yet one may be a good and the other a bad one. To copy a lens which has been constructed on an exact mathematical formula, without a knowledge of that formula, is an empirical proceeding which may frequently end in failure.

The Orthoscopic Lens is essentially a *view* lens. It would be impossible to construct a portrait lens on that principle. Its advantages are stated to be,—first, that it includes a wider angular field of view than the common view-lens; and secondly, that it gives a flatter field, with more equal illumination in every part. These are great advantages, and we shall be delighted to find that so much can be realized by this new arrangement of lenses, but we must confess that at present the arrangement does not appear to us to be at all calculated to do what has been stated of it. As a matter of theory, we cannot at present understand it; but, at the same time, we have great faith in such a man as M. Petzval; and Mr. Knight assures us that so far as he can judge from the image on the ground glass, the lens does all that has been said of it.

The following brief description of the "Orthoscopic Lens" must suffice for the present:—

There are two compound lenses. The front lens is large, and resembles that of Voightlander's present portrait combination; but the focal length is shorter, and it is consequently thicker in the middle. It is formed by cementing together a double convex lens of crown glass, and a double concave lens of flint, and is placed with the convex side towards the object. The outer concave side of the flint is nearly plane. The posterior compound lens is formed of two, not cemented together, but merely touching at the edges. These lenses are much *smaller* than the front lens. The inner one is of flint, and double concave, the outer one, (that is, the lens next the picture), is of crown, and meniscus, with its concave side next to the concave side of the flint, so that a wide space intervenes between them on their axis. The posterior compound lens is placed pretty close to the front lens, and is concave, the total thickness of glass at the edge being greater than that in the middle, so that it makes the focal length of the entire combination greater than that of the front lens; or, to speak mathematically, the focal length of the front lens is *negative*, that of the back lens *positive;* (the focal length of a lens being called *negative* when it is measured on the *opposite* side of the lens to the origin of light, and *positive* when measured on the *same* side).

The front lens does not allow whole pencils to reach their destination on the focussing screen. The oblique pencils are small, and pass excentrically through the front lens, and centrically through the back lens, against which a stop is placed. This construction would lead one to imagine that the curvature of the field would be approximately spherical, the centre of the sphere being that of the outer face of the lens next the picture; so that as regards flatness of field, the common view-lens would have the advantage. But this *prima facie* view of the matter may turn out to be incorrect. The common form of view-lens would also appear to give quite as equal illumination as the arrangement which we have described; but certainly, in point of orthoscopicity, or freedom from distortion, the new arrangement would have the advantage, for the same reason that a picture, taken with

the small central part of a view-lens is more free from distortion than that taken with the same lens, and the stop at a distance in front of it.

But more of all this in our next number. We shall take the earliest opportunity of trying the Orthoscopic Lens, and if it answers, shall do our best to call attention to its merits.

Mr. Salmon, Optician, of No. 100, Fenchurch Street, has just brought out a new form of stereoscope, which is an approximation to that described in No. 30 of this Journal. The lenses are large whole lenses, placed $2\frac{5}{8}$ inches from centre to centre. Bye and bye, opticians will perhaps bring out the right thing, the mathematics of which we have given in No. 30, and the theory of which stands unrefuted, and a reproach to all who now make, or sell the present form of stereoscope, in which everything is dwarfed to the dimensions of a little model, situated a couple of feet from the nose. We purchased one of Mr. Salmon's stereoscopes, and find it very good in some respects, but faulty in others ; the square diaphragms, for instance, are placed too near together, so that a strip of black shadow overlaps or veils a portion of the picture on each side. In many respects it is a great improvement on the common form for viewing printed positives, making things look larger and more distant, besides being very convenient in construction, *and a step in the right direction.* Bye and bye, we confidently predict, semi-lenses and prisms will be entirely given up, and whole lenses used, placed $2\frac{1}{2}$ inches from centre to centre, the pictures being taken so as to suit this arrangement, in the manner described in *Notes*, No. 30. The refracting stereoscope will then be no longer a toy, but a scientific instrument, and the objects of the picture will be seen with the *natural* and true axial convergency of the eyes, which causes them to appear of their proper size, and at their proper distance. It is scarcely necessary to observe, that when whole lenses are used, placed at $2\frac{1}{2}$ inches from centre to centre, the rule for taking and mounting the pictures, described in No. 30, must be rigorously attended to. We have tried this form of stereoscope, and it answers perfectly.

A few words now on the Exhibition of the Photographic Society.

It is on the whole a very fine Exhibition, containing many splendid works, but we did not observe much that was indicative of *progress.* A large and well-lighted room at the South Kensington Museum, is completely filled with upwards of 700 subjects, about 550 of which are by the Wet Collodion Process, 7 by Albumen, 45 by Waxed Paper, 32 Calotypes, 23 Positives on Glass, 10 by a process entitled "Photo-Flemish Painting," which we never heard of before, 0 Daguerreotypes, (although the Catalogue is entitled "Exhibition of Photographs and Daguerreotypes"), and the remainder by various preservative processes. There are besides, three tables of Stereoscopes, and a Monster Camera made by Mr. Ottewill, upon Capt. Fowkes' plan.

Our visit was a very hasty one, and if we now briefly mention a few only of those works which we remember as remarkably fine, or as showing artistic feeling and the exercise of the intellect, we beg to say that one of our subscribers, in whose critical judgement we have great confidence, has kindly promised to write a careful review of the Exhibition, and we have no doubt that many contributors, whose names we do not now mention, will have ample justice done them when this is published in our columns.

The works which we thought particularly fine were principally by Mr. Roger Fenton, Mr. Howlett, Mr. Frith, Messrs. Caldesi and Montecchi, and Mr. Rejlander. Nothing can possibly be finer of their class than many of these subjects. There were also some others which caught our eye and delighted us extremely. One of them is a little bit of Jersey Coast Scenery, by Mr. Harral, (No. 118), and another, a bit of Mountain Scenery, with a winding road, by Mr. Lyndon Smith, (No. 497). Among the portraits, we thought that of the Rev. Baptist Noel, by Mr. C. J. Hughes, one of the finest in the room, and the group of Bridesmaids, by the Messrs. Caldesi and Montecchi, and two other groups, in the same style, by the same gentlemen, extremely charming ; but the bridesmaids are creatures of earth, and not the goddesses they were represented in the "Illustrated London News." Photography rarely does justice to youth and loveliness in woman. This style of introducing a number of figures into a portrait, and vignetting them in a long oval, is very artistic. Mr. Crookes's instantaneous views of waves on the beach of the North Sea, deserve great praise for their originality; but they lose much of their interest through not being seen in the stereoscope. We paid this gentleman a well-merited compliment last year for the taste he displayed in mounting his view of the moon. This year again his mode of mounting is very effective, and the tint of the margin of his prints so delicate as to lead one to imagine they are printed on ivory. On

the whole we are not sure that these "waves" did not please us as much as anything in the Exhibition. The only view of clouds is by Messrs. Ross and Thomson; it is very good indeed, but small. These gentlemen have exhibited some very nice things in cases, hung in different parts of the room. Mr. Lake Price's subjects are, to us, exceedingly disagreeable, although perhaps clever in some respects. He entirely sets at defiance the laws of chiar-'oscuro, and his lights are chalky and dotted about all over the picture, like the light squares of a chess-board. These subjects only require the raw crude colouring of a Maclise to render them perfectly odious. There is no art in such productions, but the very antithesis of it, and we make it a matter of conscience to point them out as specimens of a style and mode of treatment to be carefully avoided by photographic artists. How different are such subjects as Mr. Price's "Robinson Crusoe," to the works of Rejlander and Fenton, in which we find breadth of effect combined with delicacy of detail and gradation of shade. Our readers should study attentively the "Summer" and "Winter" of Mr. Rejlander (No. 482). He will find them round the furthest and darkest corner of the room, near the Monster Camera. These studies combine the merits of a Deuner, a Titian, and a Rembrandt, and are admirable for expression, half-tone, chiar-'oscuro, and pose; their only fault being, in our opinion, that the prints are a little too red. As for the works of Mr. Fenton, there is so much character about them, that whether it be the copy of a painting by Raphæl, or a bust in the British Museum, or a study of Highland Scenery that we are looking at, we know it to be a "Fenton," without consulting the catalogue; and on first walking round the room and taking a general survey of things, we go straight up to these works, and to those of Mr. Rejlander, knowing at once whose they are, and feeling, as we cannot help doing, that these gentlemen are, in their respective styles, greatly in advance of other photographers, not in manipulation, but in their thorough appreciation of what is right and good in art, and their desire to realize it, as far as possible, in Photography, irrespective of trouble or expense.

We must now lay down the pen. We have returned home at the last moment, and these hasty remarks must go to press without revision. On a future occasion we shall return to the subject of the Exhibition, and talk about some other matters for which we have not space at present.

ON PRINTING BY DEVELOPMENT.

In No. 42 of this Journal, I gave the formula for a method of printing by development, without a toning bath, promising to resume the subject on an early occasion, and discuss more minutely the various points indicated in the formula. This promise I shall endeavour to fulfil in the present article.

In the First Operation the paper is *immersed* in a solution of salt and water, to which some lemon juice is added.

The quantity of salt, by weight, to the ounce of fluid, should be about one-fourth that of the nitrate of silver to the ounce of fluid in the nitrate bath. The relation between the strength of the salt and silver baths is a very important point. The effect of too much salt in proportion to the silver is this;—on floating a piece of paper, strongly salted, on a comparatively weak nitrate bath, the chloride of silver formed does not adhere to the paper, but lies like a powder on the surface, or comes off in the bath; and when the paper is exposed to light it is either very insensitive, and will not darken to a colour deeper than a pale grey, or it darkens very unequally, in patches, some parts being brown and vigorous, and others pale and grey. When the sensitive paper is in a proper condition, there is sufficient excess of free nitrate of silver to fasten the chloride to the paper, and also to produce an evenly rich brown or purple tint, by a short exposure to sunshine. The nitrate bath gets weaker in silver with every chlorided paper that is floated upon it, therefore, after a time, the effects due to the disproportionate strength of the salt bath are produced. By sufficiently strengthening the nitrate bath these effects disappear.

On the other hand, if the silver bath is too strong for the salt bath, that is to say, if the silver bath remains at 30-grains to the ounce of water, while the salt is diminished, say from 7 to 2 grains to the ounce of water, the sensitiveness of the paper is diminished, and a longer exposure is necessary in order to produce a visible picture of the required strength. The colour is redder than when the proper quantity of salt is used, and the development gives a comparatively poor thin picture, which is deficient in material. If the paper is salted in the usual way, in a seven or eight grain bath, and then excited on a very strong silver bath, containing, say 120 grains to the ounce of water, the sensitiveness of the paper is not increased, but rather diminished, and the intensity of the visible picture, produced in a given time, is rather less than when the usual proportions

are observed; but the development proceeds with great rapidity, and produces very black, or green-black tones, of considerable vigour and opacity.

When the salt and silver baths are both strengthened in the same proportion, that is to say, to 30-grains of salt and 120 grains of silver to the ounce, the paper is rendered more sensitive, the development proceeds more rapidly, the finished picture exhibits increased opacity, and the finer details of the shadows are liable to be buried amidst a mass of densely precipitated material.

When a very dense negative is to be printed, the quantity of salt should be diminished, and the time of exposure must be increased. This will lessen the force of contrasts in the positive, and bring out the details in the high lights.

When the negative is uniformly thin and deficient in density, abounding with half-tone and fine details, with but little force of contrasts, rather more salt should be used, and a shorter exposure given. Say, instead of seven grains of salt and 30 grains of silver to the ounce of water, 12 grains of salt and 45 of silver.

The object of adding lemon-juice to the salt bath, and immersing the papers in it, is to completely neutralize any free alkali which the paper may contain, or to increase its acidity, so as to preserve the purity of the lights, and prevent the formation either of an insoluble compound within the pores, or a red deposit on the back, produced by the decomposition of the developer, which often happens in those parts when a sufficient excess of acid is not present to prevent it. The quantity of lemon juice which should be added to the bath will depend upon the kind of paper used. Some English papers are sized with alum, and have a feeble acid reaction, while some foreign papers contain caustic potass and sulphide of sodium, and have an alkaline reaction. The latter kinds of paper require more lemon juice and longer immersion than the former. It is a better plan to acidify the paper by adding acid to the salt bath, than to increase the acid in the nitrate bath.

The acidified salt bath will not keep for many days. The lemon juice becomes decomposed by keeping. When done with, the bath should be thrown away. It is better to use lemon juice than citric acid, because the former contains a mucilage which is capable of combining with oxide of silver, and increasing the vigour of the proof.

With respect to the different chlorides which may be substituted for salt. The colour of the print appears to be affected, to some extent, by the particular chloride used; but I cannot tabulate the results correctly at present, and shall therefore defer offering any remarks on this part of the subject until I have made an exact series of experiments. Chloride of sodium appears to be, on the whole, a very good chloride to employ. I am inclined to think chloride of ammonium not so good, because the nitrate of ammonia formed in the nitrate bath is an unstable salt, which allows the ammonia to escape, and the nitric acid to be set free, in the bath; and also because nitrate of ammonia being a solvent of oxide of silver, its presence in the nitrate bath may interfere with that peculiar action which takes place between the nitrate of silver and the lemon juice, and gives surface-vigour to the print. Papers salted with chloride of barium, or excited on a nitrate bath containing nitrate of baryta, seem to give proofs of a peculiar plum-colour, when the nitrate of silver is not much in excess.

When lemon juice is added to the salt bath and nitrate bath, there is no necessity for adding gelatine, or serum of milk, or any similar organic substance to the salt bath. The print is quite as sharp and vigorous without as with these substances. Serum of milk contains organic salts, which appear to add greatly to the density of the precipitate. For this reason it should be used with caution in negative papers, as its effect is to lessen the sensitiveness, and interfere with the half-tones, at the same time that it renders the blacks very opaque.

The sharpest prints are obtained on the finest foreign papers, with the hardest texture and smoothest surface. The most artistic prints, as regards general effect and colour, are obtained on Hollingworth's THIN paper. The *common* Whatman's paper is coarse, woolly, and nearly worthless for photographic purposes.

Salted papers would no doubt keep without spoiling for a long time *in a dry place;* but lemon juice is prone to decomposition, and salt to attract moisture, which favours decomposition.

The reader must not suppose the use of lemon juice in this process to be empirical, or of questionable utility. The difficulty in every printing process on plain paper is to obtain surface-vigour. Paper is a rough absorbent substance, and the metallic precipitate which forms a picture on such a surface is very liable, when dry, to exhibit a mealy appearance, just as dry colours do before they are mixed with oil or some organic cement. The silver which forms the shadows of a print must be combined with organic matter, or it has a dry powdery

appearance, devoid of richness and vigour. I have tried a great variety of different methods of increasing the surface-vigour of a print without having recourse to albumen, and by far the best plan I know of at present is to employ lemon juice (not citric acid), in the way recommended.

So far as surface-vigour and *finesse* are concerned, it is quite immaterial whether a paper is immersed or floated on the salt bath; but if immersed it becomes more thoroughly saturated with acid, and therefore more likely to keep clean during development. The effect of acid in preserving a mixture of gallo-nitrate from decomposition is shown by first mixing gallic acid and *neutral* nitrate of silver, in a test tube, and then adding citric acid, and noting the difference. In the former case decomposition begins at once; in the latter the mixture keeps clean for a considerable time.

The equivalent of chloride of sodium is 60, and of nitrate of silver 170. If, therefore, a 10-oz. bath, containing 60 grains of chloride of sodium, were added to a 10-ounce bath containing 170 grains of nitrate of silver, the whole of the chlorine in one bath would unite with the whole of the silver in the other, and form chloride of silver, and no free nitrate of silver would remain. In the same way, if a sheet of paper were first floated on the salt bath and dried, and then on the silver bath and dried, it follows, if we suppose the paper to be equally absorbent, and to imbibe an equal quantity of each solution (which would not however be strictly correct), that the quantity of salt in the paper would be exactly decomposed by the quantity of nitrate of silver imbibed, and that chloride of silver, without any excess of free nitrate, would be deposited on the paper. It follows, therefore, that the nitrate bath should be much stronger in silver than the quantity indicated by a comparison of its equivalent with that of chloride of sodium. That is to say, instead of taking the proportion of 17 grains of nitrate of silver to 6 grains of salt, about 30-grains of nitrate to 8 of salt would be better.

The Nitrate Bath.—The proportions are about 30 grains of nitrate of silver and 8 minims of lemon juice to the ounce of distilled water. Fused nitrate of silver answers extremely well, and gives more vigorous prints than nitrate of silver which smells strongly of nitric acid, But if nitrate of silver, adulterated with nitrate of potass, be fused, the latter salt parts with oxygen and becomes converted into nitrite of potass; this decomposes nitrate of silver and forms nitr*ate* of potass and nitr*ite* of silver. Fused nitrate of silver should therefore be pure, for there is nothing worse in a bath than nitr*ite* of silver, and nothing more certain to produce fog and discolouration. The only remedy for such an evil is to add nitric acid to the bath, then to exactly neutralize it with carbonate of soda, and afterwards to add the lemon juice.

On first adding lemon juice to the nitrate bath a small quantity of a pale yellowish substance, probably citrate of silver, is formed, but this is immediately dissolved by stirring with a glass rod. A slight cloudiness is also produced, which is removed by filtering through cotton wool. If a pin is dipped into the bath, the bath is certain to become blackened in a few hours, and this tinge cannot be removed by filtering.

The nitrate bath acts best when first made. It gradually gets out of order by use, but adding more silver and lemon juice, together with a little citrate of soda, restores it to a tolerably good condition. The best way to ensure absolute uniformity in the prints is to apply the nitrate with a Buckle's brush, instead of floating the paper on a bath. The exciting solution is then always in the same state. The want of uniformity in printing, no doubt depends greatly on the variable state of the nitrate bath. When the bath is out of order the print does not begin to develop of a fiery tint, as it ought to do, but of a brownish olive tint, which passes eventually to a disagreeable olive black.

Filtering the nitrate bath through animal charcoal, or keeping it in a bottle shaken up occasionally with kaolin, and decanted for use, keeps it always pure and clean, but it rather injures that peculiar quality of the bath which produces fiery-red pictures in the early stage of the development. This quality appears to depend upon the presence of an organic compound of silver held in solution by the nitrate, and when this peculiar combination is disturbed, the bath gives but indifferent pictures as regards tone and artistic qualities.

But whatever the defects of the nitrate bath may be, and however difficult it may be perfectly to understand and remedy them, they may be completely avoided by applying fresh solution to every print by means of a brush.

After the print has been excited it is hung up to dry. Chloride of silver is not dissolved, like iodide of silver, by a concentrated solution of nitrate, and therefore the full excess of nitrate in the paper may be allowed to dry in it. The use of this is two-fold, as will be explained when I come to the theory of the process. When reddish tints are preferred to black, the excess of nitrate of silver should be removed by blotting paper; but this plan

appears to injure the definition, and the continuity of the shades. A better plan would be to float the print on a second bath, say of 5 grains of nitrate to the ounce, and then hang it up to dry. The print will then be of a beautiful reddish purple or plum colour, instead of black; but certainly less able to withstand destructive influences.

Citric is a much more powerful acid than acetic, for it contains a much greater excess of oxygen; and for the same reason tartaric is a much more powerful acid than citric. About one grain of citric acid appears to be equivalent. *in Photography*, to a scruple of glacial acetic acid. Lemon juice contains about one-twentieth part of citric acid; therefore equal quantities, by measure, of lemon juice and glacial acetic acid, produce about equal effects in photography.

Citric acid belongs to the same class of acids as gallic. It is a feebly reducing agent, and a pyro-acid may be formed from it. Citrate of silver is darkened by exposure to light, and a red organic sub-salt of the metal formed. All these red organic compounds of silver are capable of being intensified more easily, and to a greater degree, by decomposing gallo-nitrate, than the grey metallic substance produced when organic matter is not present, as in the case of a collodion positive. This red portion of the image is less permanent than the black precipitate which is thrown down upon it by the developer.

The Development.—The developer is made by adding four grains of gallic acid to the ounce of distilled water, shaking up well, and using in the course of half-an-hour or so.

When the print is made into a tray, and the gallic acid poured in, the nitrate of silver in the paper is dissolved, and mixes with the gallic acid, forming gallo-nitrate of silver. This is the true developer, and not gallic acid. The way in which it acts in intensifying (or developing) the already faintly visible picture, will be explained when I come to discuss the theory of the process.

The gallo-nitrate gives a tint, exactly resembling that of India paper, to the lights of the proof, and the longer the paper is in contact with it the stronger this tint becomes. When not too strong it is extremely beautiful, and a great improvement to the picture. I am not able to explain why it is produced or what is its chemical composition; neither the silver bath, nor gallic acid alone will produce it; but it is formed on a piece of unsized paper, left for half-an-hour immersed in gallo-nitrate. It appears to be either an organic compound of sub-oxide of silver with lignine and oxydized gallic acid; or of sub-oxide of silver with lignine alone.

The development should begin with a fiery red tint and pass gradually to a black. The black deposit is but little affected by the fixing bath, but the red part of the image is reduced in intensity and *toned* if the print is left too long in it.

The development should not be stopped too soon, for it is the black substance produced in the last stage of the process which gives vigour and permanence to the print. This black material appears to be more nearly metallic silver, and less complex and easily decomposed than the red material at first produced, in which organic matter evidently plays a more important part.

A long exposure and short development gives a red picture, resembling in its properties a sun-print. A short exposure and long development gives a black picture entirely different in its composition and properties from a sun-print, and considerably more permanent, and better able to resist destructive tests.

Fixing, &c.—As soon as the print is developed it is well washed in water, and then placed in a solution of fresh hyposulphite of soda, containing 5 per cent of the salt.

The object of this hypo-bath is simply to dissolve the chloride of silver, and prevent the light from acting any further upon the print. If any other solvent could be substituted, it would probably be an improvement. Cyanide of potassium acts too energetically on the organic part of the image; and ammonia darkens the picture all over by decomposing the trace of gallo-nitrate left in the paper; but if the gallo-nitrate could be first removed by any substance, ammonia might afterwards be employed. I am engaged in some experiments in this direction, which will be described if they lead to anything valuable.

As soon as the chloride is dissolved by the hypo, the print should be removed, and well washed, and the hypo thrown away. The print is no sooner placed in hypo than a peculiar sulphureous smell is emitted by the bath, which indicates the presence of that destructive agent which has ruined so many thousands of fine photographs. From that instant this destructive agent commences his work by toning the red organic part of the image, at the same time that the chloride is being dissolved out. The print should not remain in this villanous bath an instant longer than is necessary for the complete removal of the chloride of silver. This may take from ten to twenty minutes. At the end of that time the bath is generally very slightly milky, and is then in a highly active and wicked state, as far as toning goes. The more thoroughly

the print is washed before putting it into hypo the better, but it is impossible altogether to avoid bringing about this dangerous condition of the bath, and when the hypo is stronger the evil is increased in proportion. Those photographers who place an *unwashed* sun-print, having but feeble powers of resistance, in a *strong* hypo bath, which has been used in a similar way (no matter whether gold be present or not), are taking the very means, of all others, most likely to cause the fading of the proof.

If the print is left in the hypo bath for two or three days, or hung up without being washed, it fades to a greenish yellow tint. No argentine photograph will bear this treatment without being destroyed. It is important then to wash the print well, in order to remove every trace of hypo that may cling to the paper. The best way of doing this is to lay the print at the bottom of a dish, and pump upon it, first on one side then on the other, several times. Then press it between dry cloths, and let it soak for a couple of hours in fresh water. Lastly, press it again between cloths, and hang it up to dry. I am now of opinion that long soaking and excessive washing is a bad plan. Energetic treatment *at first* is what is wanted, and not long soaking in water, which is more likely to do harm by getting up, or confirming a tendency to fade in the insoluble organic image, than to do good by removing any supposed last traces of soluble hypo from the paper.

But although I have admitted that a developed print *can* be destroyed, or *may* fade through injudicious treatment, I must not be misunderstood. I have for years advocated the permanence of developed prints, and every years' experience strengthens my conviction on this point. But the term "permanent" is relative, and not absolute. Nothing in nature is *absolutely* permanent. Printers' ink and Indian ink may both be considered permanent, and yet both can at once be destroyed by chlorine, and converted into chloro-carbonic acid, and other compounds. By the permanence of developed prints, I mean that the material of the image is more stable, in consequence of being less organic and more metallic, than that of a sun-print, as well as existing in much greater quantity; and that when both are submitted together to the same destructive bath, the fully developed print, or a calotype negative, will withstand with impunity, for several hours, an action capable of utterly destroying a dozen sun-prints in succession. I once entirely destroyed a sun-print by half-an-hour's immersion in a bath which produced no appreciable effect in 12 hours upon a developed print. The metallic character of the image produced by development may be easily proved, by drying an unvarnished collodion negative, and rubbing it lightly with a piece of leather. The picture is then, to all appearance, burnished metallic silver. I do not assert that it is actually pure metallic silver, because carbon may be present in small quantity, just as steel is a carbide of iron; but I do assert that all experience goes to prove that this dense metallic image is less likely to fade into a yellow transparent substance than the thin organic compound produced by the direct action of light, and which mere contact with a hot finger will change in a single day from brown to yellow

It now remains for me to discuss the theory of this printing process, and to go thoroughly into the chemistry of it. But this will occupy many pages, and I must defer it for the present. Should space permit, I will conclude the subject in the next number. I have great hopes of being able to put this matter in a clear and satisfactory light, by arguments founded on experiment.

There is also a great deal to be said about the quality of developed prints, as compared with those by the direct process.

[Ed. P. N.]

ON MOLECULAR IMPRESSIONS BY LIGHT AND ELECTRICITY.

BY W. R. GROVE, ESQ., V.P.R.S.

The following is an abstract of a lecture, delivered by Mr. Grove, at the Royal Institution, on Jan. 29:—

"The term *molecular* is used in different senses by different authors. It is used this evening to signify the particles of bodies smaller than those having a sensible magnitude, or as a term of contra-distinction from masses. If there be any distinctive characteristic of the science of the present century as contrasted with that of former times it is the progress made in molecular physics, or the successive discoveries which have shown that when ordinary ponderable matter is subjected to the action of what were formerly called the imponderables, the matter is molecularly changed. The remarkable relations existing between the physical structure of matter, and its effect upon heat, light, electricity, magnetism, &c., seems, until the present century, to have attracted but very little attention: thus, to take the two agents selected for this evening's discourse, Light and Electricity, how manifestly their effects depend upon the molecular organization of the bodies subjected to their influence. Carbon, in the form of diamond, transmits light but stops electricity. Carbon, in the form of coke or graphite, into which the diamond may be transformed by heat, transmits electricity but stops light. Leonard Euler alone conceived that light may be regarded as a movement or undulation of ordinary matter; and Dr. Young, in answer, stated as a most formidable objection, that if this view were correct, all bodies should possess the properties of solar phosphorus, or should be thrown into a state of molecular vibration

by the impact of light, just as a resonant body is thrown into vibration by the impact of sound, and thus give back to the sentient organ an effect similar to that of the original impulse. In the last edition of his 'Essay on the Correlation of Physical Forces (1855),' Mr. Grove has made the following remarks on this question :—'To the main objection of Dr. Young, that all bodies would have the properties of solar phosphorus if light consisted in the undulation of ordinary matter, it may be answered that so many bodies have this property, and with so great variety in its duration, that *non constat* all may not have it, though for a time so short that the eye cannot detect its duration.' The above conjecture has been substantially verified by the recent experiments of M. Niepce de St. Victor, of which the following is a short *resumé* :—An engraving which has been for some time in the dark, is exposed to sun-light, as to one half, the other half being covered by an opaque screen; it is then taken into a dark room, the screen removed, and the whole surface placed in close proximity to a sheet of highly sensitive photographic paper, the portion upon which the light has impigned is reproduced on the photographic paper, while no effect is produced by the portion which had been screened from light; white bodies produce the greatest effect, black little or none, and colours intermediate effects. Mr. Grove had little doubt that had the discourse been given in the summer instead of mid-winter, he could have literally realised in this theatre the Laputa problem of extracting sunbeams from cucumbers! Whilst fishing in the Autumn, in the grounds of M. Seguin, at Fontenay, Mr. Grove observed some white patches on the skin of a trout, which he was satisfied had not been there when the fish had been taken out of the water. The fish having been rolling about in some leaves at the foot of a tree, gave him the notion that the effect might be photographic, arising from the sunlight having darkened the uncovered, but not the covered portions of the skin. With a fresh fish a serrated leaf was placed on each side, and the fish laid down so that the one side should be exposed, the other sheltered from light: after an hour or so the fish was examined, and a well-defined image of the leaf was apparent on the upper or exposed side, but none on the under or sheltered side. The number of substances proved to be molecularly affected by light is so rapidly increasing, that it is by no means unreasonable to suppose that all bodies are in a greater or less degree changed by its impact. Passing now to the molecular effects of electricity, every day brings us fresh evidence of the molecular changes affected by this agent. The electric discharge alters the constitution of many gases across which it is passed, and it was shown that by passing it through an attenuated atmosphere of the vapours of phosphorus, this element is changed by the electric discharge into its allotropic variety, which is deposited in notable quantity on the sides of the receiver. In this experiment the transverse bands, or striæ, discovered by Mr. Grove in 1852, are very strikingly shown. The glow which is seen on excited electrics, such as glass, was also shown by Mr. Grove to be accompanied with molecular change. Letters cut in paper, and placed between two well-cleaned sheets of glass, then formed into a Leyden apparatus, by sheets of tin foil on their outer surfaces, and then electrified, by connexion for a few seconds with a Ruhmkorf coil, had invisible images of the letters impressed upon the interior surface, which were rendered visible by breathing on them. and rendered visible, and at the same time permanently etched by exposure, after electrization, to the vapour of hydro-fluoric acid. So, again, if iodized collodion be poured over the surface of glass having the invisible image, and then treated as for a photograph, and exposed to uniform daylight, the invisible image is developed in the collodion film, the invisible molecular change being conveyed to the collodion film, and rendering it, when nitrated, more sensitive to light in the parts where it has been in proximity to the electrical impression, than in the residual parts. Here we have a molecular change, produced first by electricity on the glass, then communicated by the glass to the collodion, then changed in character by light, and all this time invisible, and then rendered visible by the developing chemical agent. Mr. Babbage had observed that some plates of glass which had formed the ornamented margin of an old looking-glass, and were backed by a design in gold leaf, covered with plaster of Paris, showed, when this backing was removed by soft soap, an impression of the gold-leaf device, which was rendered visible by the breath on the glass. Some of the plates had been kindly lent by him for this evening; and in one Mr. Grove had removed a portion of the backing, and the continuation of the gilded design came beautifully out, by breathing on the glass while in the frame of the electric lamp, and was projected (as were the previous electrical images), on a white screen. Of the practical results to science of the molecular changes forming the subject of this evening's lecture, a beautiful illustration was afforded, by the photographs of the moon by Mr. De la Rue, which afforded, by the aid of the electric lamp, images of the moon, six feet in diameter, in which the details of the moon's surface were well-defined, —the cone in Tycho, the double cone in Copernicus, and even the ridge of Aristarchus, could be detected. The bright lines, radiating from the mountains, were clear and distinct. A photograph of the planet Jupiter was also shown, in which the belts were very well marked, and the satellites visible. The following question was suggested by Mr. Grove :—As telescopic power is known to be limited by the area of the speculum or object-glass, even assuming perfect definition, as the light decreases inversely as the square of the magnifying power, a limit must be reached at which the minute details of an object become lost for want of light. Now, assuming a high degree of perfection in astronomical photographs, these may be illuminated to an indefinite degree of brilliancy by adventitious light. With a given telescope, could a better effect be obtained, by illuminating the photographic image, and applying microscopic power to that, than by magnifying the luminous image in the usual way by the eyeglass of the telescope? Can the addition of extraneous light to the photograph permit a higher magnifying power to be used with effect than that which can be used to look at the image which makes the photographic impression? In other words, is the photographic eye more sensitive than the living eye; or can a photographic recipient be found which will register impressions which the living eye does not detect, but which, by increased light, or by developing agents, may be rendered visible to the living eye? The phenomena treated of this evening, which are a mere selection from a crowd of analogous effects, show that light and electricity, in numerous cases, produce a molecular change in ponderable matter affected by them. The modifications of the supposed imponderables themselves have long been the subjects of investigation; the recent progress of

science teaches us to look for the reciprocal effects on the matter affected by them. Few, indeed, if any, electrical effects have not been proved to be accompanied with molecular changes; and we are daily receiving additions to those produced by light. Mr. Grove feels deeply convinced that a dynamic theory, one which regards the imponderables as forces acting upon ordinary matters in different states of density, and not as fluids or entities, is the truest conception which the mind can form of these agents; but to those who are not willing to go so far, the ever-increasing number of instances of such molecular changes affords a boundless field of promise for future investigation, for new physical discoveries, and new practical applications."

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEAR 1856.

BY J. W. G. GUTCH, M.R.C.S.L.

"The glorious Sun
Stays in his course, and plays the Alchemist."
—*King John.*

To the Editor of Photographic Notes.

DEAR SIR,—I know not if the following homely kind of epistle will be deemed of sufficient interest for you to make a note of, and yet I fancy that oftentimes such memoranda and jottings of past experiences, prove of much more *practical* benefit to our brothers in the art, than the more elaborate or *theoretical* in the art, at all events they are very useful and acceptable to the beginner. I wish to send you a tolerably detailed account of my photographic proceedings during the last two years, and having met (I will not say with *invariable* success, for who is the photographer that can with truth say that), but having met with certainly more than the average success, and which I entirely attribute to the means employed, I am inclined to think that others may be induced to follow in my steps, and as I make it a rule to have no secrets, I do not at all see why they should not be equally, or perhaps even more successful, than I have been. From ill-health and lameness, I was on the point of giving up Photography, when, in the early part of 1856, I was shown, for the first time, an "Archer's Camera," which appeared to me so thoroughly to combine all that could be desired, and to obviate the very difficulties that had previously beset my path, in the form of tents, dark rooms, &c., that I at once purchased one, and have never repented my bargain; nay, I will say more, that I have never done any good photographs with any other camera that I am enabled to do with the Archer; and I have now had some fifteen or sixteen years of experience in the art, and have tried very many of the multitudinous forms that are offered to the public.

For out-of-door, or field-work, it appears to me to combine *every possible requirement* that the photographer can possibly desire; it is portable; the tripod stand, which is quite peculiar in construction, is decidedly the firmest and steadiest of any kind yet offered; it is readily adjusted, lengthened, or shortened, at will; the camera is quickly unpacked, mounted, and as readily undone; it is wonderfully steady, even in windy weather; it contains ample chemicals for a fortnight's work; two water-tight baths, viz., one nitrate bath and one water bath, one box for twelve plates, focusing glass, &c., &c.; and when out, *every process is carried on within it, readily* and without any inconvenience; viz., the coating the plate with collodion, exciting the plate in the nitrate bath, exposing and developing it, and, if you please, clearing off the iodide of silver with the hypo or cyanide; thus, in fact, with the exception of varnishing, producing a negative ready for the copying-frame. To do this comfortably, I calculate takes, on an average, half-an-hour on each picture; but then how great an advantage this mode has over the old plan, or the other one hundred and fifty contrivances for oxymel plates, sugar plates, dry plates, albumenized plates, &c. You immediately, in the Archer camera, *see* if you have succeeded in taking a good negative, and if not, of course proceed to go over again the same ground; not as I have many and many a time done, come home, after many and many a long ride, and found all my day's work abortive, and after all my trouble and expense failed to obtain one picture; with an Archer's camera, it is only of course a matter of time, should the first attempt fail, but under any ordinary circumstances, and with all in working order, the failures come very rarely indeed, and fine pictures are the rule; another great advantage is, you may, up to the size of the bath, use *any* size of glass, as no chassis is employed, thus doing away with the *necessity* for the glass being *accurately cut* to suit the exact size of the frame in which it is to rest; and this is a very great advantage, as I have often found, in my various journeyings.

In my camera I can do portraits or views from one inch up to nine inches, with equal facility, and no change of frame or any other adaptation, but of the most simple kind; and now, after this laudatory preface, (perhaps too much so, you will exclaim, though in sober truth, I have not in any way exaggerated or over-praised it), I will go through the whole routine of my operations, and that as briefly as I can, though with every good intention of not taking up more of your columns than I can help, to describe on paper the operations; but to be understood will necessarily entail a somewhat lengthy epistle.

Glass.—I use the St. Helen Company's flattened sheet glass, and for pieces 9 $\times$ 8 I pay 12s. per gross, or a penny a piece. I used to employ the more expensive kinds, and tried even the plate, and not finding the increased beauty of the negative at all equivalent to the increased expense, I abandoned it, and have no cause to regret the course I have, for two years, steadily persevered in.

Cleaning the Glass.—Equal parts of liquid ammonia and spirits of wine, thickened with common chalk to the consistency of cream, rubbed over the glass, on both sides, and when dry rubbed off with one leather, and polished, when about to use it, with a second; this plan I have never found to fail.

I carry the plates with me, (generally a dozen), when cut, in a small bag, made of American cloth, with a handle, and buttoned cover.

Coating the Plate, and just a word or two on the various kinds of plate-holders. Having tried them nearly all, I have, during the last year, contented myself with one, consisting of two circles, the lower, or under one, of gutta-percha, and stiff, the upper one being a little larger, and lying on it, of india-rubber, and pliable. It is *not* pneumatic, or very adhesive, but with most ordinary care and a very little use quite sufficiently so to answer every purpose;—the pneumatic ones are all very nice, so long as they *keep in order;* but I think all must have discovered that the period of time that they are pneumatic is but short, and then they become worse than useless. Messrs. Horne & Thornthwaite have just brought out a new holder, but I have not seen it. To proceed then;—In calm, still, fine weather, I frequently coat my plate in the open air, and if any air be stirring in my camera; my two arms being passed through the two sleeves at the side, and my head being covered over, with the focusing apron, and a small window at the top of the camera, covered with yellow oil silk to give me light, and the back of the camera open, I readily perform that part of the manipulation.

Exciting the Plate.—I make my bath according to the following formula:—

Into a 20-ounce stoppered bottle put nitrate of silver, 1 ounce; distilled water, 2 ounces; dissolve. Iodide of potassium, 4 grs.; distilled water, 1 drm.; dissolve. Mix these two solutions; the precipitate iodide of silver thus formed, is, by shaking, entirely dissolved. Now add fourteen ounces of distilled water, when the excess of iodide of silver is again thrown down, but in such a finely denuded state as to render the complete saturation of the bath, with iodide of silver, perfect. This I generally leave for the night, and in the morning filter it into my bath, where it remains all the year, and very rarely wants any change being made, except of course from time to time renewing it with a 30-grain solution of nitrate of silver as it evaporates or is wasted; I have never yet, in a single instance, added *either acid or alkali*, or *ever tested* for acidity or alkalinity. The bath is one that you purchase with the camera, and is a very economical one, it consists of a wooden case, lined on the inside with glass, narrower (I mean the back and front closer together) at the bottom than at the top, and *just wide* enough to admit the dipper and plate, keeping the former carefully sliding on the back of the bath; it fits into a linen bag on the floor of the camera, and is kept slightly inclined, to obviate the risk of rubbing the plate in putting it in or drawing it out. I use the ordinary crystallized nitrate of silver, which I obtain from Simpson and Maule, at 3*s*. 8*d*. the ounce; I tried the fused, which is rather dearer, and I fancied the bath did not work so well. Before exciting my plate I shut up the back part of my camera, which, in place of the usual sliding groove for the chassis and focusing glass, has only a door hinged at the bottom and folding or dropping down; at the top of this door is an opening large enough to see through, and having a sliding shutter inside, which is most readily opened or shut by the arms from the inside, thus easily rendering the camera, before withdrawing the face covered by the focusing hood, perfectly light-tight; and having thus done, I cover my head with the focusing apron, pass my arms through the sleeves, open the lid of my nitrate bath, which is made water-tight, with two brass screws and a double layer of thick India-rubber cemented on to the lid, and pass the plate steadily down, shut the lid, and open the camera. I now proceed to

Focus.—This is done entirely from the inside, the lens being fixed, and thus saving much weight and also the expense of the rack work. There is a light frame traversing the interior of the camera and sliding in two grooves on either side with a bar of wood at the bottom, and several small bits of gutta-percha let into it and notched; on this rests the focusing glass; it is confined and kept in its upright position by a bar of wood, hinged on one side, and moving in a slit on the other; the loose end descending, rests on the one corner of the top of the glass, and holds it firmly; the frame is drawn backwards and forwards until the right focus is obtained, and then a peg of wood is withdrawn and fixed so that the frame can be pushed forwards to its original position, close to the lens, but cannot be drawn back, or from the lens, further than to the peg of wood, which marks the exact place where the best focus was obtained; all this time the plate is of course in the bath; I generally leave it four minutes; I invariably use some collodion which I find *constant* in its qualities, and good. I obtain it from Messrs. Taylor and Brothers, in Vere Street, Oxford Street, and can conscientiously recommend it in the strongest terms, from two years continued use of it. I now replace the frame of ground glass in a small groove that carries it in the inside of the camera, replace my collodion bottle in the little tray which *always* remains under the camera, and on either side of the lens, fill a small glass half-full, say half an ounce, with the developing mixture (the formula for which I will give later), withdraw my arms from the sleeves, close the back of the camera, close the little shutter, which can be done *out*side as well as *in*, and open the small shutter at the roof or top of the camera, thus admitting yellow light; finally shut the *sliding* shutter or lid of the lens, (very preferable, in my opinion, to any form of *cap*). It is more quickly closed, and no chance of falling off or getting bruised and out of order: and all is now ready for the exposing the plate; to do this I again introduce my arms through the sleeves, place the hood over my head and shoulders; from the inside open the back window, and by the aid of the yellow light withdraw the excited plate carefully from the bath, drain for a few seconds, and then place it in the focusing frame; I then draw the frame and glass towards me, the frame having been previously *pushed from* me into its place to give room for the hands, &c., in the camera, and having satisfied myself that it is well "home," and resting against the peg, thereby insuring its being in exactly the right focus, I, from the inside, shut the slide admitting the yellow light, and thus test at once the *light-tightness* of the camera, the smallest pencil of rays being then visible; shut from the inside the small shutter at the back and withdraw my arms, and, opening the lens, expose the plate. The time for this part of the operation, I need not say, must vary according to circumstances. I have,

during the summer of last year, left my plate as long as twenty minutes, and with marked success; a very beautiful negative of a window in Conway Castle, was the result; I have also taken most excellent ones in about thirty seconds; but I always prefer *over* than *under*-exposing. I now shut the lens, re-introduce my arms through the sleeves, from the inside open the slide at the top, for admitting the yellow light, also, from the inside, open the window at the back, the hood of course being on my head and shoulders, and pushing the focusing frame back into its place, I take out the glass, turning it on its corner, and thus bringing the collodion surface towards me, place it in the dipper, and redip it into the nitrate bath, for an instant only, withdraw it, well drain it, place it on the holder, (which I keep in my left hand, and the glass with the developing fluid in my right), and proceed to pour it rapidly and *evenly* over the plate, taking care to commence at the *top* of the plate as it comes out of the nitrate bath; till I adopted this plan I constantly had my pictures disfigured by those unsightly stains, so much dreaded and so well known to all new beginners. I now pour off and on until, by holding the plate up and *under* the yellow window, I consider the development has been pushed far enough; I then drain for the last time, and opening the lid of a bath which fits in front of the nitrate bath, also in a linen bag, and is filled with plain water, or water with a little common salt, I drop the plate in with a wooden dipper, and shutting the lid I am able, with safety, to admit the light by unclosing the back of the camera; I leave it in this bath for two or three minutes, and then can bring it out into broad daylight, and if satisfied with the result place it in the plate-box.

The developing mixture that I find answers very well, is composed of—

Pyrogallic acid..............	4 grains.
Glacial acetic acid...........	1 drachm.
Spirits of wine..............	1 "
Water.........................	3 ounces.

In summer rather more acetic acid.

I always carry a good supply of ready-*weighed* Pyrogallic in my pocket-book, and wrapped up in a small bit of oiled silk, they will keep good for a long time—months; the spirits of wine and glacial acetic acid are *always* in the tray inside my camera, which contains bottles in the following order:—

Mixed collodion.............	7 ounces.
Glacial acetic acid..........	2 "
Spirits of wine..............	2 "
Developing fluid.............	6 "

and a division for the small glass, for holding it and pinning it on. The plate-box, which is also part and parcel of this most ingeniously constructed camera, is calculated to hold eight or a dozen plates; it opens at the front and top, and the glasses are placed and confined in a groove at the *bottom*, either side being free, and the grooves cut as close as possible to each other; they are prevented from touching each other, by the groove at the bottom, and by a small piece of gutta-percha, with a groove in its edge, being placed on the glass, at the top. I generally lay loosely a duster, or piece of rag, on the back of the plate, thus securing it from motion, shut the side and top lid, and in this way, I have carried a dozen plates over the roughest of roads, and for hundreds of miles uninjured; I generally clean them after I return home, though of course this can be done readily enough on the spot, if you can obtain a sufficient supply of water to give the plate the necessary washing; I always use the cyanide, using the same over and over again, only occasionally adding a lump or two, as it gets weak and ineffective. It now only remains to dry the plate and varnish it. I accomplish the former thus: two small strips of wood, notched, say a foot long, and placed at their extremities in two upright end pieces; I rest the negatives, angle fashion, between the two long slips, and leave them to dry spontaneously; when dry, I varnish with some French varnish, made and procurable at 1s. 6d. per bottle, at Mr. Gaudin's, Snow Hill, London, with which I have no fault to find. It is hard and very quickly dried; it requires the plate to be heated before pouring it on, and dried by the fire or in the sun afterwards. Having now succeeded in getting a satisfactory negative, the next duty is to carefully preserve it, and to do this, I first place it on a sheet of writing paper, cut to the *length* of the glass, and fold this over it, labelling the outside with one of the adhesive druggist's labels, that you can buy by the hundred, ready gummed, and of any size. I take six negatives, and laying them one on the other, place them in a small calico or brown-holland bag, and again label with the contents; four of such bags, also labelled on the edge, fit into a divided box, which is made to contain one hundred and fifty plates, standing edgeways. They travel in this way perfectly safe, as I can testify from my boxes having been thousands of miles, by sea and land, railway and coach, waggon, and many other conveyances, and no accident or breakage of any kind, ever having occurred. I have now with me, in two boxes, three hundred good negatives, the result of the last two years' work, and all perfect and uninjured, although some have been copied hundreds of times, and all have travelled hundreds of miles.

Having obtained the negative, the next operation, and concluding one, is the proof of its goodness, by copying it on paper, and this I shall now proceed to describe; and here again I am indebted to the ingenuity of Mr. Archer, in the copying frame, which is of the simplest kind, and much lighter, much cheaper, and equally efficacious, with all the complicated and expensive ones, sold in the shops, possessing to any one travelling, a great objection, from their *weight* as well as bulk. Archer's frame may be made by any common carpenter for 1s. 6d. It is a light frame of wood, rabitted to carry the glass, with a hinged back, *thicker at the hinge* part than the front. Over the glass is placed the negative, then the paper, then three or four folds of thick flannel or drugget, and the back is then shut and confined with two wooden buttons, taking care that the padding is sufficiently tight to cause the necessary and due pressure. With four of these frames, and *four* hands, we last year copied 2,800 photographs $7\frac{1}{2} \times 8\frac{1}{2}$.

The Paper.—I use Marion's paper, and prefer, of his various kinds, the *thin* ammonium salted,

(this is of course all ready for the nitrate bath), or the plain *thick*, which I prepare thus: salt first by *brushing* (the form of brush I will shortly describe), over with a solution of muriate of ammonia, five grains to the ounce of water, and a half-a-grain of iodide of potassium. Hang up to dry, and excite by the ammonio-nitrate process, two drachms of nitrate of silver, to the ounce of water; precipitate by the liqueur ammonia, dropping it in till the precipitate is re-dissolved, and fill up to two ounces with water; brush this also over the previously prepared salted paper, and hang up; and moving about from place to place, as we have been now for two years, I find my bag that holds my camera in travelling, a most convenient dark room for drying my paper, without any chance of spoiling furniture, and conveniently in every way answering the purpose. The brush I use is thus made: six *swan's*-quill camel's-hair pencils are placed as close to each other as they will lie, on a piece of softened gutta-percha, which forms the handle, and securely fastened by laying a soft piece of gutta-percha *over* the quills; you thus have a broad and convenient brush, and which can be readily renewed at will.

The ammonium salted paper is excited in a glass tray, fitted into an outer wooden one, for the purpose of travelling, and containing ten ounces of a 60-grain solution of nitrate of silver, and float each sheet for five minutes.

Fixing Solution.—I have two hypo baths, the first, made thus, is of course the toning bath:

Hypo-sulphite of soda.......	$2\frac{1}{2}$ ounces.
Chloride of gold...............	6 grains.
Common salt....................	2 scruples.
Nitrate of silver..............	1 drachm.
Water...........................	1 pint.

dissolve the nitrate in 2 ounces of water, add the common salt, stir well together. I allow the precipitate which forms to subside, pour away the upper clear fluid, and fill up again with water; allow to subside, and again pour off three separate times, then add to the precipitate 18 ounces of water and the hypo-sulphite of soda, and stir well together until dissolved; lastly, add the chloride of gold, previously dissolved in the remaining two ounces of distilled water.

FIXING SOLUTION.

Hypo-sulphite of soda...........	3 ounces.
Water..................................	1 pint.

Into this I now immerse the print, leaving it until the whites become pure, and the colour of the picture is such as I desire. I then withdraw it and wash it with many waters, leaving it for 48 hours, and during that time, treating it twice with boiling water, poured on each print; I then dry between blotting paper, and placing it under a screw press, it is ready for mounting.

One other memorandum, and I shall conclude this dry portion of my epistle, but still I hope it will not be found an unprofitable one, at least to the beginner, and possibly to the student more advanced in this most fascinating art. I attach my pictures to the *wastes*, with gum, dissolved in vinegar, which keeps good for any time, slightly touching the edges *only*, and I have never, in a single instance, found this solution *stain* or *spot* the many thousands that I have had to prepare. I get my *wastes* (quarto ones), from Woolley, in Holborn, who charges 8s. the hundred for them. In describing the above manipulations, I very possibly may not have made myself as intelligible as I could have wished; but if any difficulty should arise in the mind of the reader, and he will address a line to me, directed to No. 9, Upper Victoria Place, Clifton, I will, with pleasure, give him the fullest benefit of my experience, and any explanation that he may desire.

Having thus finished the *dry* descriptive part of the story, I will, if permitted, add a few remarks and jottings, touching the localities visited, and journeyings made, during a two years' pilgrimage, performed mainly in search of health; and as an occupation is, with me, as much a necessity as any medicine for the body, I made choice of photography, as one in every way answering my desires, nor have I been in any way disappointed in my expectations.

(To be concluded in our next.)

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ON GLASS PLATES FOR VIGNETTING.

To the Editor of Photographic Notes.

DEAR SIR,—I have much pleasure in responding to your kind note. The object in producing Vignettes is to take from the mechanical effect of a photograph by giving it a halo; this is done simply by "stippling" the glass over with the following composition:—

Flint glass...	5 parts	Finely ground before using.
Pearl ash	3 "	
Black oxide of manganese...	6 "	
Oxide of copper...	3 "	

the material being black and "stippled" gradually towards the centre excludes the light in the process of printing. It is afterwards permanently burnt-in to the body of the glass; of course you understand that it is a flat plate, and merely laid upon the negative while printing. There is another process by the camera in which the black part is produced in yellow, thus excluding the light in the same manner, but as it has only been recently tried, I cannot speak very confidently regarding it. I enclose you a print produced by the first process.

JAMES ALEX. FORREST.

58, Lime Street, Liverpool.

☞ *The Letters of "A Photographic Fellow," R. M. Parker, and the Replies to "J. L." R. Linsley, "J. L. F." Mr. O'Toole, Rev. K. E., "Delta," "J. B. P.," "Subscriber," &c., &c., must again be deferred until our next publication.*

Photographic Notes.

MARCH 15, 1858.

We have a most important piece of news to communicate, relative to Positive Printing. The problem of printing a pure photograph in CARBON has at length been completely and satisfactorily solved, and, we are happy to say, by one of the Subscribers to this Journal. We received from this gentleman, on the 5th instant, two positive prints, which are stated in his letter to have been printed direct from the negative, in carbon, by a process known only to himself, and which he has himself discovered.

These prints are quite as sharp and good as ordinary photographs. The whites are as pure as the original white of the paper, and the blacks the same colour as Indian ink, and quite free from fog. We believe it would puzzle Mr. Colnaghi, or any other dealer in prints, to tell these photographs from old engravings. We say *old* engravings, because, although the paper is not in the slightest degree tinted by the process, yet the blacks have not quite the same vigour and depth as a proof fresh from the printing press. In this respect there is certainly room for improvement, but in general effect they are very good and presentable.

Our correspondent has not favoured us with all the particulars of his process, nor does he wish his letter to be published; but he is anxious to exhibit some specimens of the new style of printing, and has asked our advice on this matter. Knowing the great interest which his Royal Highness the Prince Consort takes in the subject of Positive Printing, we immediately enclosed the two prints to his librarian, Dr. Becker, and begged that he would show them to His Royal Highness, and inform him of the important discovery which had been made in photography. The advice we gave our correspondent was, to publish the particulars of his process at once, and trust to the generous policy being the best in the end.

We shall no doubt have more to say on this subject in cur next number. Dr. Phipson, some time ago, deposited a sealed packet with the French Academy of Sciences, the contents of which were stated to relate to a process of printing in carbon; and M. Poitevin has done something, but we do not know exactly what, in this direction. We have ourselves experimented with pieces of paper, blackened all over with a mixture of Indian ink and bi-chromate of potass, (see *Notes*, No. 42, p. 7), exposed under a negative, and then washed to remove the black material from those parts where light had not acted; and our results, although imperfect, were sufficiently good to induce us to throw out a hint which might be followed up by other experimenters. Now, however, printing in carbon is an accomplished fact, and we think it certain to effect, ere long, a complete revolution in the present modes of photographic printing. There is no doubt that a variety of coloured substances might be substituted for carbon, if fancy tints were desired. It is enough to have established the fact that a vigorous black can be obtained in carbon, at the same time that the absolute purity of the whites is preserved.

We must not forget to mention that one of the carbon prints was a copy of an engraving, a portrait of Captain Cook, 8ins. by 6ins.;—the other a view from nature, 11ins. by 8ins. The material of the print appears to be superficial, and has but little density when viewed by transmitted light.

To turn to other topics:—

A second paper by M. Niepce de St. Victor, on the subject of his experiments with latent light, was read at the Meeting of the French Academy of Sciences, on March 1st. We shall give a full account of this communication in our next number.

A new and ingenious optical instrument called the TELE-STEREOSCOPE has been invented by Professor Helmboltz. It is composed of two small reflectors, placed at right angles, as in the reflecting stereoscope, and two larger reflectors placed opposite to them, at a distance of about a foot. When this instrument is presented to distant objects, such as ranges of mountains, having great relief *inter se*, but too far off for the difference of binocular parallex in ordinary vision to be appreciated by the spectator, it enables him to obtain as it were a view from stations wider apart than the two eyes, and thus to gather information with respect to the relative distances of distant objects. This is a very elegant application of the principles of binocular vision, and the instrument is by no means a toy, but one which might be turned to account in science, and which no traveller should be without.

We take considerable interest in matters relating to the stereoscope and binocular vision, and have gone over the geometry of the Tele-stereoscope very carefully. The theory of it is certainly correct. We find that when presented to near objects, an opposite effect may be produced by widening the angle between the outer mirrors; this

has the effect of diminishing the relief of near objects and sending them back apparently to a vast distance.

Another use of the Tele-stereoscope, and one well worthy the attention of our professional readers, is this: pictures intended for the small refracting stereoscope cannot exceed 3-ins. in diameter, because, when mounted, the distance between their centres must not exceed that between the centres of the entire lenses of the stereoscope; and again, large pictures intended to be viewed in the reflecting stereoscope are reversed, if printed from glass negatives taken in the ordinary way, and if taken in a non-reversing slide are frequently only fit to be viewed in the stereoscope, the objects being reversed when seen out of it. Now, with the help of the Tele-stereoscope, a pair of large prints, mounted side by side, and taken in the ordinary way, may be viewed stereoscopically by simply placing the instrument opposite to them, with the large mirrors exactly facing the pictures, and at the proper distance apart. Large portraits on the whole plate, taken simultaneously with two cameras, and exhibited in this way, would no doubt be very fine, particularly if the instrument were provided with a pair of magnifying lenses mounted in spectacle frames attached to the edge of the small mirrors. This year, we are told, money is to be so abundant, that people are scarcely to know how to get rid of it. Our hint, cleverly carried out, might perhaps have the effect of attracting some of it from the pocket of the wealthy to that of the artistic photographer, particularly if the apparatus is *handsomely got up*. There is a great deal in *this*. How often have the brass stand and morocco binding been the means of selling inferior stereoscopes and still more inferior slides.

Correspondents are continually enquiring about copying cameras, and filters for collodion, or varnish. In a letter just received from Mr. Atkinson, of Liverpool, he says:

"I have received a small solar camera from Messrs. Anthony, of New York. It answers exceedingly well, and produces a large and well defined life-size picture, with a half plate lens. It is a most expensive instrument."

With respect to a filter for collodion, or varnish, the best plan would certainly be, to have a wide mouthed bottle, and a stopper with two holes in it, one for inserting the neck of a funnel, the other for inserting a syringe for exhausting the air within the bottle. If opticians would bring out something of the kind there would be a large sale for it.

The reader will find among the correspondence a letter from Mr. Thompson of Weybridge, on the subject of employing photography as a means of discovering new planets. We think his suggestion very good. The uninitiated are sometimes under the impression that the discoverer of a new planet must be a man of wonderful talent and acquirements; but that by no means follows. There is all the difference in the world between predicting the possible existence of such a planet as NEPTUNE, and assigning its probable place by a long series of calculations, and discovering such a planet as VIRGINIA, the 50th of the Asteroids. The latter bodies are discovered by a process which is extremely mechanical, and which consists in what is called "mapping,"—that is, making maps of all the stars within a certain distance of the ecliptic, and then comparing the maps from time to time, and seeing whether any of the stars so mapped have changed their place with respect to the others. Any star which is thus found to change its place, is set down as a wanderer, or "planet," and observations are at once made upon it, from which, in time, its elements are determined. Now, if the collodion film could be made more sensitive, or the mounting and mechanism of the Equatoreal more correct, photography would afford a ready and admirable means of "mapping," and in this way would be a great help in the search for new planets.

Nothing of any importance occurred at the last meeting of the French Photographic Society. The Society has determined not to have an Exhibition this year.

Messrs. Knight have sent us an "Orthoscopic Lens," No. 1, for trial. The weather has been so boisterous and cold, that we have not yet been able to take any negatives with it out-of-doors, but have examined carefully its construction, and the image it gives on the ground glass. The results are as follow:

In the first place, the lens may truly be termed "Orthoscopic." It does not distort the straight lines of the image to anything like the same extent as the ordinary view-lens with a stop in front. The very slight amount of distortion which it produces, has the effect of rendering straight lines *convex* to the centre of the picture, and not *concave*, like the ordinary lens. This is a very great improvement. We have frequently found, in copying paintings, engravings, &c. with the common view-lens, that the lines of the frame have been considerably bent. The distortion produced by using a large view-lens with a stop in front is a serious evil, and not in any way diminished by using a small stop,—which merely improves the definition without altering

the curvature of the lines. The superiority of the Orthoscopic Lens over the common view-lens, in the matter of distortion, is very marked, and this superiority is proved at once by the following experiment:—Place the lens at the back of a room, opposite a closed window, and pull out the camera sufficiently to get an upright bar in focus at the edge of the ground glass. The image of the bar will scarcely deviate perceptibly from a straight line, when brought against the upright side of the focusing screen, by turning the camera. If the same experiment is tried with a common view-lens of equal focus, and covering the same angular field, the ends of the bar are bent inwards, not merely perceptibly but *considerably*. Freedom from distortion therefore is a great merit of the Orthoscopic Lens.

With respect to flatness of field; we think the common view-lens has the advantage. When the Orthoscopic Lens, of 11½ins. focus, is turned to a sharp horizontal line of sea, and the image received on a plate 10 × 8, an angle of 47° is included, and the camera must be pushed in half-an-inch, in order to get the edge of the sea-line into focus, after having focused for the centre of the field. This shows curvature of the image, but less than we expected to find. When the quarter-inch stop is used, the No. 1 lens covers a field 10 × 8 very well indeed.

The radius of curvature of the image is considerably longer than the focal length of the lens. Our first impressions were that the centre of the face of the back lens would be pretty near the centre of the curved image, but on further examination we find that the oblique pencil, owing to a circumstance which we shall explain, with the help of a diagram, in the next number, has a longer focus than the central pencil. This important point should be clearly understood, for the flatness of field is determined by it, and the lengthening of the focus of the oblique pencils is a very elegant property of the arrangement.

Having thus examined the image on the ground glass, our conclusions are, that whenever a sufficiently small stop may be introduced, to give good marginal definition, the Orthoscopic Lens should certainly be used in preference to the other. It is certainly the best lens for copying sculpture, maps, &c.

We hope to be able to try it out-of-doors in a day or two, and shall then return it to Messrs. Knight, with some collodion negatives taken with it.

A committee, composed of MM. Léon Foucault, Bayard, and Bertsch, has been appointed by the French Photographic Society to try the Orthoscopic Lens, and their report is highly favorable to it.

We have sent to the Editor of the "Photographic Journal" a demonstration of the property of the plano-convex lens alluded to in *Notes* No. 43, and the "Photographic Journal," No. 63; and also, a complete investigation of the course of an oblique pencil through an achromatic plano-convex lens. With respect to Mr. Grubb's last letter, the facts are simply these:—In a paper by him, read at the Meeting of the Photographic Society in December last, he denied the property of the plano-convex lens which we have demonstrated, and first mentioned, at page 153 of the "Photographic Journal," for April 1855; we put him right, and told him where he would find it demonstrated by Professor Airy; instead of thanking us for the information, and confessing that he had learnt something which he did not know before, he tosses up a great cloud of words, in the midst of which he hopes to escape from this admission; but unfortnnately for him, he has, in the No. of the "Photographic Journal," for June, '55, endeavoured to trace, in his own way, the course of an oblique pencil through an uncorrected plano-convex lens, and if the reader will compare that diagram with ours in No. 62 of the same Journal, he will perceive that Mr. Grubb's is wrong, inasmuch as he has made the field nearly flat when it ought to be greatly curved, and has given besides a wrong arithmetical estimate of the amount of curvature. This erroneous diagram and piece of arithmetic are convincing proofs that he was ignorant of the property of the lens which we have stated; and the whole tenor of his letters convinces us that he is quite out of his depth in the theory of optics. In his paper on the "depth of chemical focus," he endeavours to include the visual and chemical pencils in the same line of argument, forgetting that half the spectrum is actinic, and that an achromatic lens of TWO glasses can only combine TWO lines of the spectrum, leaving uncombined foci of various shades of colour on either side of the combined focus. This fact entirely upsets his line of argument, and leads to the conclusion that he does not understand the scientific value of the terms "achromatic," and "chemical focus." Practical carpentry, brazing, and lens grinding, do not teach a man the *science* of optics; nor are the truths of geometry to be established by rule and compasses, as Mr. Grubb would have us believe they may be.

We have received for review, from Messrs. Negretti and Zambra, a superb collection of transparent stereoscopics of the ruins of Egypt and Nubia, by Mr. Frith. Nothing that we

have seen in photography has interested us so much as this collection,—not even the beautiful Swiss views of M. Ferrier, which we have carefully compared with them. Mr. Frith has proved himself equally successful with plates of the largest dimensions, and those for the stereoscope; and he is not only a skilful manipulator, but his subjects are remarkable for the judicious selection of the point of view, and observance of the time when the shadows are most effectively cast. His negatives are perhaps a trifle too dense for copying by development on glass slides, though not for sun-printing. The positives appear to have been printed on albumenized glass, and not on either dry or wet collodion. We prefer the black tint of some of Dr. Hill Norris's slides, to the reddish-brown of those on albumen, but the latter are superior in the density of the dark touches. Organic matter, capable of combining readily with silver, seems to be as necessary to give vigour to the blacks of a transparent print, as to one on paper.

We conceive that nothing finer or more interesting has yet been done in Photography than these Egyptian Stereoscopics, by Mr. Frith. Our readers should by all means take the first opportunity of inspecting them. The complete series comprises a hundred different subjects.

We have received Nos. 1 and 2 of the "Photographic Art Journal." The photographic illustrations are remarkably good, and the copy of a statue of "Gondoline," in No. 2, is in every way a gem. The light and shade are beautifully managed, and there are no snowy patches, which are the reproach of so many photographs. This Journal is ably conducted, and well deserves support. The Editor is working in the right direction, and endeavouring to infuse more of Art into Photography. The wood engravings are not good, and one half of them might surely be dispensed with.

We insert with pleasure, at the request of Herr Pretsch, the following letter from him, on the subject of M. Petzval's lens:—

"67, Great Portland Street, London,
"March 8, 1858.

"Sir,—Concerning a communication in the number of the *Photographic Notes* of March 1st, about Prof. Petzval's lenses, I beg to state that they are executed under his personal superintendence, marked with his initials on the brass mountings, and are not the same as Messrs. Voigtlander & Co's. I have had lately a few of them in London, and hope to import more of them into this country.

"I have no doubt that Prof. Petzval himself will reply to the letter of Messrs. Voigtlander & Co., contained in the *Notes* of February 15th. But it appears to me very curious that some people, although they are obliged to acknowledge the merits of Prof. Petzval, try to make the public believe that *they* are the proper persons to execute his ideas, and sell his lenses.

"A fact, not less curious, happened lately at a trial of such a lens, by a distinguished photographer in this country. It was proved with great cleverness that no lens is able to take a picture, but that there is generally required for this purpose a photographer to do it,—a fact which, I think, was known before the Photographic Society in the large metropolis of England was erected.

"I regret very much not having seen you on your last visit to London.

"I beg you will do me the kindness to insert my note in the next number of your esteemed Journal. Discussion there ought to be, but no suppression or undue influence. "Paul Pretsch."

We shall be very happy to insert any communication from M. Petzval, and have enclosed to Herr Pretsch, to be forwarded to him, the diagram relating to the curvature of the field of the Orthoscopic Lens. M. Petzval's opinion on this point we should be extremely glad to have.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, February 23rd, 1858.

Mr. J. C. Phillips, in the Chair.

Mr. Phillips, Jun., read a paper "On the Use of Artificial Light for Night Photography."

After describing the Oxy-Hydrogen Light, and the various compositions used for Artificial Light, he proceeded to exhibit the Apparatus now used for confining the fumes of the burning material;—and also shewed the light burning. He expressed his opinion that the use of Artificial Light would never become general for the purposes of Portraiture.

A long discussion ensued, in which Messrs. Rejlander, Osborn, Haines, Morris, and Phillips, with several visitors, took part; and the general tone of which was decidedly unfavourable to the use of the light.

Dr. Hill Norris exhibited one of Dancer's Patent Dry Plate Cameras, the ingenuity and convenience of which were greatly admired.

After votes of thanks to Mr. Phillips and Dr. Hill Norris, the meeting adjourned until March 30th, when Mr. W. B. Osborn, the Treasurer, will read a paper "on Photography; its adaptation to the Present Wants of Society, and its future Prospects."

CHEMISTRY OF POSITIVE PRINTING.

In No. 42 of this Journal I described the manipulation of a very simple process of Printing by Development, and in No. 46 offered some remarks on the manipulatory details; I will now endeavour to discuss the Chemical Theory of Photographic Printing, stating what I believe to be the nature of the change produced by light on the sensitive surface, and the composition of the material which forms the shadows of the photographic picture.

In Printing by Development there are two distinct stages of the operation. In the first place, light produces a faintly visible picture, —and in the second place, the developer intensifies that picture to the proper degree. We have therefore first to consider the nature of the change produced in the sensitive surface by light, and afterwards the effect produced by the developer. These considerations must be kept entirely distinct from one another.

First then,—What is the change produced by the direct action of light on a sensitive surface composed of chloride of silver, nitrate of silver, and organic matter?

If we take these ingredients separately, and expose them to light under ordinary influences, we find that chloride of silver, without excess of nitrate, is darkened to a greyish tint;—that nitrate of silver, either in crystals or solution, is *not* affected by light;—that nitrate of silver, spread upon paper, or mixed with organic matter, *is* slowly darkened by light;—and that the addition of organic matter to chloride of silver makes no perceptible difference in the result, unless free nitrate be present.

On the other hand, when these materials are combined, as in the Photographic process of printing, the effect is very different from what occurs when they are exposed to light singly, or as described in the preceding paragraph. The greyish tint of chloride of silver, or the slow reddening of nitrate and organic matter, is replaced by a very rapid and vigorous action, which produces, in a few minutes, an intense purple-black, or bronzed appearance of the part exposed.

Now, in order to understand why this is, we must begin with simple experiments, and advance step by step towards our conclusion.

In the first place, we must endeavour to discover why chloride of silver is darkened by light, and what are the products of its decomposition.

It is found, that whenever chloride of silver is exposed to light, in the ordinary atmosphere containing aqueous vapour, or under water, or nitric acid, or benzole, or oil, or any substance containing HYDROGEN, with or without oxygen, its surface is darkened, and becomes of a greyish tint; while, if it be exposed under Nordhausen sulphuric acid, in a *full stoppered bottle*, that is to say, under a liquid which does not part with hydrogen, it is *not* darkened by light, nor decomposed. It appears that the presence of hydrogen is necessary to the decomposition of chloride of silver by light; and if we further consider the powerful affinity which exists between hydrogen and chlorine, and the energy with which light combines these elements, we get a clue to the solution of the problem.

It appears nearly, if not absolutely certain, that when chloride of silver is exposed to light in the presence of hydrogen, or any fluid containing hydrogen, an atom of hydrogen takes an atom of chlorine from two atoms of chloride of silver 2 (Ag. Cl), and forms hydrochloric acid, (H, Cl), and sub-chloride of silver, 2 Ag, Cl. This sub-chloride of silver is a well-known compound of the metal which may be obtained in other ways. It is of a purple colour, insoluble in nitric acid, but decomposed by ammonia, hypo-sulphite of soda, and cyanide of potassium, in the following way:—Ammonia decomposes it into chloride of silver and metallic silver, and dissolves the chloride of silver. Hyposulphite of soda forms with it the double hypo-sulphite of silver and soda, which is a soluble salt, chloride of sodium, metallic silver, and a compound of sulphur and oxygen, which eventually acts on the silver and converts it into sulphide. Cyanide of potassium forms with it a soluble double cyanide of silver and potassium, chloride of potassium, and metallic silver.

Such appears to be the action of light upon chloride of silver. When exposed under water, the water is found to contain hydrochloric acid (not chlorine); and when exposed under nitric acid, the acid neither retards the action of light, nor attacks the sub-chloride produced; as might have been expected *a priori*.

It appears that sub-chloride of silver is with great difficulty reduced by light to the metallic state. It is even doubtful whether it is reduced at all.

Now, if the reader will refer to any experiments which have been made on chloride of silver, and examine them by the light of this hypothesis, he will see how completely it appears to explain all the facts; and he may then be inclined to indulge in a smile at Dr. Guthrie's experiments, described in a number of the "Chemical Gazette," a few months since, and at the conclusions founded thereon—one of which was, that the

metallic silver supposed to be produced by the action of light on the chloride was thrown into a passive state, which rendered it impossible for nitric acid to act upon it. (!)

Having now shown what the effect of light upon chloride of silver in presence of hydrogen most probably is, it remains for me to explain why chloride of silver, which only darkens superficially and slowly to a slaty colour by itself, should darken rapidly to a violet black when nitrate of silver is also present.

It will be remembered that hydro-chloric acid, (not chlorine), is given off when chloride of silver is darkened by light. Now this hydro-chloric acid decomposes the free nitrate of silver, and forms more chloride of silver. This is precipitated on the previously reduced sub-chloride, and is decomposed by light, thus furnishing more hydro-chloric acid, and more chloride of silver; and so on, until the whole of the free nitrate is converted into chloride and reduced. In this way particles of reduced sub-chloride are heaped one upon the other until a rich purple-black precipitate is produced. Had there been no free nitrate the *surface* only of the chloride would have been darkened, and the sub-chloride spread upon the white ground of unreduced chloride beneath.

When organic matter is present, the process of darkening is somewhat retarded. The nitrate of silver enters into combination with the organic matter, and is reduced by light to a red substance of unknown composition. This action, taking place simultaneously with the other, interferes with it to some extent, and the mixture of reduced material is no longer blue-black, but of a reddish-purple tint.

The material of a sun-print is therefore composed, if my hypothesis be correct, of *purple* sub-chloride of silver, together with a *red* compound of silver and organic matter, which, for the sake of brevity and convenience, I will call reduced "organate of silver."

A mixture of chloride and nitrate of silver, in a test tube, *without* organic matter, is never bronzed by light. Bronzing always indicates the presence of organic matter. When organate of silver is exposed to light it first becomes red, then bronzed. The red material is perhaps a complex substance, containing carbon, oxygen, silver, and hydrogen. The bronzed substance is perhaps simply a carbide of silver. But this is mere speculation.

So far then I have endeavoured to explain the effect produced by light on sensitive positive paper. Wherever light acts, a chemical change takes place in the material exposed to its influence, and this produces a visible picture. I conceive that everywhere the change is chemical, and not molecular. In the lighter parts of the picture, where no *visible* impression is made, there is nevertheless a chemical change produced, only feebler in degree, and we cannot *see* it simply because our eyes are not good enough.

In sun-printing, the picture is printed of the required intensity by pushing the exposure to the proper extent. In development-printing, the faint picture produced by light is intensified by a subsequent independent process. So far as exposure goes, the explanation of what takes place is equally applicable to both processes. But I have now done with sun-printing, or direct exposure, and the next thing to be considered is, how, in the development process, the faint sun-print is intensified by gallo-nitrate of silver. [Ed. P. N.]

(To be continued.)

ABSTRACT OF SPECIFICATION.

M. FERRIER. ON PRINTING TRANSPARENCIES, &c.

No. 2315.—JACQUES ALEXANDRE FERRIER, of Paris, in the Empire of France. "Improvements in transparent photographic pictures, and their application to stereoscopes." 4th September, 1857.—Not completed.

"The invention relates, first to a new means "of re-producing transparent photographic "representations, or pictures, on other sub-"stances than glass; secondly, to the "application of such pictures or representations "to stereoscopes.

"These substances are gelatine, gutta-"percha, dissolved in chloroform, in benzoin, "or its solvents, pharmaceutical collodion, "and India-rubber, dissolved, siccative oils, "mucilaginous substances, starch, or other "amylaceous substances, such as arrow-root, "tapioca, &c; soluble or fusible resins, "gallipot, pounce, white, or yellow wax, either "in solution or in fusion."

Stereoscopic pictures thus prepared have the fineness and transparency of those on glass, without being either heavy or fragile.

The negatives which are to be copied are taken in the usual manner, and the positives are produced from them in the followtng manner:—

"On a smooth and transparent (? semi-"transparent), surface, such as porcelain, "alabaster, white marble, glass &c., previously "cleaned, a light coating of neutral (? plain) "collodion is spread, which is allowed "to dry for at least an hour." It is then coated with albumen by pouring on a super-abundant quantity. Rendered sensitive by immersion in a solution of aceto-nitrate of silver, and washed in plenty of water. When perfectly dry, it is applied to the negative and exposed

to light, developed by gallic acid and nitrate of silver; fixed by hypo-sulphite of soda; coloured by any of the known means, if required.

To detach the picture from the plate, it is covered, by preference, with a coat of gelatine, dissolved in water, and placed perfectly horizontal, so that it may be equally covered all over. It is left thus until after its complete desiccation, or perfect cooling, according to the nature of the mareríal used. It is then cut on the four sides near the edges, and lifted without difficulty off the plate.

The image is thus protected by collodion on one side, and on the other side by gelatine, which may be coloured or rendered semi-transparent.

Instead of the gelatine, any of the other materials aforesaid may be used.

"I also produce a stereoscopic picture on "gelatine by making a positive representation "on glass by the aid of photographic collodion, "and then detaching it by the aid of gelatine "or gutta-percha. By this means I obtain "a result analogous to that already des-"cribed."

"I apply these photographic pictures to "stereoscopic purposes."

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ON PRINTING TRANSPARENCIES, &c.

To the Editor of Photographic Notes.

Dear Sir,—We are glad you are pleased with the Stereoscopic Views of Egypt and Nubia. They are printed on Albumenized Glass, according to the process described by H. Negretti, in the "Photographic Journal," April, 1856; in fact, by the method adopted by Ferrier, Clousard, &c. The negatives are by Frith, and the positives are printed by us, in Hatton Garden. They are *not* printed *in actual contact*, for whilst no protection can be had for photographs from negatives that may have cost thousands, we must sacrifice details which it would be dangerous to give in positives. The pictures would be twice as sharp, and infinitely more valuable, if we could be sure of their not being copied You will perhaps not blame us when we tell you that a person in .... had the effrontery to obtain from us a dozen transparent pictures of the Crystal Palace, begging us to let him have very nice ones, and some time afterwards, his traveller actually called upon us, offering us the prints from the spurious negatives, at about one-half the price that we sold ours to the trade. We beg likewise to say, that we are very much surprised and disgusted to see such an advertisement as one that appears in this month's Journal, coolly setting forth "Transparencies Copied." Under these circumstances, as long as we get negatives that, from their difficulty of obtaining, cost a great deal of money, we shall be obliged to sacrifice minuteness of detail.

We shall bring out early in April a Series of Stereoscopic Views in the Holy Land, from Jerusalem to Damascus and Boolbeck, and these remarks must apply to them also, and I believe we shall not be blamed by you.

The Stereoscope you kindly suggested is made and patented by Mr. Scott, of Dundee. We are the agents for the sale of it, and it is really the best instrument for showing stereoscopic pictures yet brought out.

Collodion, or collodio-albumenized transparencies, will never, in our opinion, be equal to albumen; they look so opaque as positives, and not at all nice. The Albumen Printing is very difficult, and certainly no amateur will ever fall in love with it; and somehow or other it plays old Harry with collodion negatives.

You are at liberty to make use of these disconnected observations if you think fit.

H. Negretti & Zambra.

March 6th, 1858.

ASTRO-PHOTOGRAPHY.

To the Editor of Photographic Notes.

Dear Sir,—Among the many ways in which Photography has been proposed, as likely to assist the Astronomers, I have not heard of its having been proposed to apply it to one, which would I think, materially assist him in his search for undiscovered planets, (Asteroids), or other moving bodies. Now if we take an ordinary inverting telescope as an example, and place a sensitive collodion plate in the focus, which will be nearer to the object glass than the eye-piece is, and proceed in every way as with an ordinary negative, we shall have an exact representation of that part of the firmament to which the telescope was directed (that is if the film can be made sensitive enough) greatly reduced in size, the stars being minute black specks. Now if we replace it in the position, in which it was when these were formed, it will be evident that they will obscure, if they can be made dense enough, those stars or other luminous bodies, so long as they remain stationary; but should one or more move only half its diameter, it would at once be seen.

The advantage would be the avoidance of tedious observation and comparing with maps, for in practice, a series of photographs of a zone of the firmament should be taken, the width of which will correspond with the field of the telescope; when an observation is to be taken, a plate, which corresponds with the part of the heavens to be examined, is placed in its position, and the instrument adjusted, which could be done very readily, by means of the brighter stars, several of which, it is almost certain, will be in the field of view.

All that is required is an extremely sensitive film, which I feel convinced might be obtained, if the same amount of energy and perseverance were to be directed to that, as was to the perfecting of

the Daguerreotype, Collodion, and other processes, to their present state. But, as the photographer does not require more sensitiveness than is to be obtained by the ordinary wet process, he has no inducement to proceed further; which leaves all future research on the subject in the hands of experimenters. Now what I think most desirable, is, that the subject should be taken in hand by some of the numerous amateur astronomers, for if a nearly instantaneous photograph could be obtained of stars of the third and fourth magnitude, with a small object glass, it would prove that by increasing its size, we should even be enabled to take photographs of some of the brighter nebulæ. In conclusion, I will point out one of the defects that have been produced on glass; it is a defect that all developing processes appear to be subject to, for the particles that have been impressed with the latent image, not only attract the substance that is used to develop them on their surface, but from all sides, which causes the image to extend beyond its natural size.

If you consider the above, or any part of it, worthy of insertion in your excellent Journal, you will much oblige

H. I. Bowles Thompson.

Weybridge.

—Mr. Thompson has suggested a truly valuable application of Photography. See our remarks on the subject of his letter in the Leader.

[Ed. P. N.]

A QUESTION IN OPTICS.

To the Editor of Photographic Notes.

Dear Sir,—So much time having elapsed since my first letter to you upon your article "Optics of Photography," I feel it necessary, in writing again for publication, as you request me to do, to draw the attention af your readers to the remarks which call forth this letter.

Sir D. Brewster states that a photograph consists of an infinite number of perspective views of the object overlapping each other, the different parts of the lenses being the different points of view from which the various perspective pictures are obtained.

In your article, Dec. 15, page 461, you state that he is in error, and essay to prove it, making the following statements among others:—

"1st—We have shewn that an object is made up of bright points, from each of which a *pencil* (not a ray) of light proceeds.

"2nd—We have taken any one of these points, and have shewn that it can have but one image, whatever part, or parts, of the lens are employed.

"3rd—We have shewn that what is true of any one point is equally true of any other point.

"4th—We have shewn that what is true of any number of points is true of the whole object,"

Turning back to see how you prove that what is true of one point is equally true of any other, I find you simply make the statement: "the same reasoning is equally true of the other points of the object; so that if," &c. Thus you seem to assume the point at issue and proceed to reason upon it as if it were proved.

It might be supposed that you were imagining some hypothetical circumstances, in which the various parts of the object were equi-distant from the lens, and the various parts of the focusing glass also equi-distant; or that the varying distance of the different parts of the object just compensated for the varying distance of the different parts of the focusing glass; but even in this case you do not make the truth of your statement evident, and to save us from disputing that hypothetical ground, take an illustration "to render what has preceded, if possible, more intelligible."

The case you suppose is a pyramid, with its apex towards the lens, and in reasoning upon it you seem to overlook the fact, that the base and the apex cannot be in focus at the same time, and that if you focus for the base, the apex, instead of occupying a mere point upon the focusing glass, possesses dimensions proportionate to the size of the lens.

If, in this manner, a 3-inch lens depicts the apex 1-inch diameter when the base is in focus, a diaphragm, with an aperture of ·3-ins. being placed before the lens will reduce the image of the apex to ·01 inch. If the aperture is in front of the margin of the lens the reduced image of the apex will be at the corresponding part of the margin of the former (·1-inch) image, and consequently it will be ·045-in. out of the centre of the image of the pyramid.

Thus, in the case you suggest, it is evident that

(2ndly) We have taken one of the points (the apex) and have shewn that it has two images when two different parts of the lens are used.

(3rdly) That what is true of one point (at the base) is not true of another point (the apex).

I have been supposing a 3-inch lens, and the use of two apertures of 3-tenths of an inch diameter; but the lens is capable of being divided into 100 parts, each having the same area at the ·3-inch aperture, and each giving overlapped pictures which would with equal certainty, though in various degrees, be incoincident, and the subdivision of the lens may be theoretically carried *ad infinitum* without at all affecting the truth of the above reasoning; it then completely justifies the statement of Sir D. Brewster that the photograph may be considered to consist of an infinite number of overlapping incoincident pictures, each of which is more perfectly a perspective view than the compound picture formed by their union.

Barnard S. Proctor.

11, Grey St., Newcatle-upon-Tyne.

—Our Correspondent has committed an error which we expected some one might correct, viz: that of attaching to our expressions a meaning which, taken literally, they do not admit of. In the former part of our article, from which he quotes, *not a word is said about a focusing screen.* The image of a point is a point IN SPACE, and the image of an object an assemblage of such points or foci, not

necessarily lying on a plane, or any regular curved surface. What we stated with respect to such an image is accurately true, viz: that no point of an object can possibly have more than one image, whatever part of the lens is employed. This statement has nothing whatever to do with a focusing screen. Our meaning must not be strained, but taken LITERALLY.

The object of our article was to prove that the different parts of a large corrected lens did NOT give a number of different overlapping incoincident PERSPECTIVE VIEWS of the object. To render this so clear as to admit of no possibility of further dispute, we will put the matter in rather a different light from before.

First; what is a perspective view?

It is a geometrical figure produced in a particular way.

Lines called "visual rays," are supposed to be drawn from the different points of an object, or objects, to the *point* of view. These lines form the edges of a system of pyramids, and a perspective view is a section of these pyramids by a vertical plane. From a given station, on a given plane, there can therefore be but one perspective view. It is a mathematical figure; and no other figure that is not perfectly equal and similar to it in all respects, can be considered a perspective view from that station, of those objects, on that plane.

But if the visual rays are produced *through* the point of view, another system of pyramids is formed, and if this system is cut by a plane parallel to the former, and at the same perpendicular distance from the common vertex, a figure is produced which *is* perfectly equal and similar to the former, in all respects. This figure may therefore be considered a perspective view, as well as the first, (See Figure, *Notes* No. 14).

It follows therefore that if an infinitely small hole be made in the front of a dark camera, the inverted image formed on the focusing screen is a perspective view of the object at which the camera is presented.

Now we come to the pith of the argument.

In the front of the camera strike a circle 3-inches in diameter, and let L, R, be the extreme points of its horizontal diameter; and suppose an infinitely small hole at L, and another at R; there will then be formed two different perspective views of the objects on the focusing screen. These views will be MORE THAN THREE INCHES APART. Any object in one of them will be more than three inches distant from the same object in the other. A man's nose, for instance, in one will be more than three inches distant from the man's nose in the other; and the same is true for *every object whatever*. No two images of the same point can by any possibility coincide. The views are not only dissimilar geometrical figures, but they are totally incoincident in all their corresponding points.

Now, make 136 more holes within the circle, and there will be formed, in all, 136 different overlapping, incoincident, perspective views of the object, as taken from the several points of view, within the circle. Observe that these 136 perspective views are all dissimilar geometrical figures, in which the homologous points are in no case coincident.

Next, increase the number of holes from 136 to infinity;—that is to say, cut a circle, 3-inches in diameter, out of the front of the box. You have then Sir David Brewster's infinite number of different incoincident overlapping PERSPECTIVE VIEWS of the objects, correctly given in the confused disc of light on the focusing screen; *and nothing but this confused disc of light can by possibility be produced by these said overlapping pictures.* If then Sir David's statement be correct with respect to the action of a lens 3-inches in diameter, no difference ought to appear when we insert in the 3-inch opening a 3-inch lens, of focal length equal to the length of the camera!!!

But is this what really happens when we use a large lens? No; NOR ANYTHING AT ALL RESEMBLING IT.

It is needless to pursue this discussion any further. We have now brought it to the "reductio ad adsurdum;" and there we leave it, never again to be introduced into this Journal, to occupy valuable space.

It is perfectly certain then, that whatever may be the defects and inconveniences of large lenses, they do NOT give an infinite number of different PERSPECTIVE VIEWS of the object from the stations afforded by the different parts of the lens.

What a large lens does generally give on a focusing screen may be easily stated. In the first place it gives a great number of sharp coincident images, whatever part of it is employed. In the next place it gives discs of light, instead of sharp foci, for a few objects whose images do not lie on the focusing screen; and if we cover up a part of the lens, these discs have a corresponding shaded portion;—if the centre of the lens is covered and its sides only exposed, then the centres of these discs are covered and only their edges exposed, and so on; *but this shading of a portion of the disc, and its subdivision into light and dark parts does not happen when the whole lens is uncovered,* and therefore, in that case, since we must consider the entire disc as a single image, *only one image* of the point in question is produced by the entire lens. Lastly, in certain cases the whole lens introduces images which might not be formed if only the centre of it were employed, as we explained in our former article, at page 463, 2nd paragraph.

These are the *true* effects produced by a large lens, and not those which Sir David Brewster has stated, in terms which only admit of one interpretation, and which cannot possibly be misunderstood.

[ED. P. N.]

PHOTOGRAPHY BY ARTIFICIAL LIGHT.

To the Editor of Photographic Notes.

SIR,—In reference to a Paper printed in your last number, and read by Mr. C. L. Haines, at the general meeting of the Birmingham Photographic Society, on the "Rise and Progress of Photography." I would respectfully claim your polite

attention in an ensuing number to my protest against some remarks offered therein on "Taking Pictures and Portraits by Artificial light" Mr. Haines, while "commending those who labour in the paths of discovery," professes himself blind to the "ultimate good of such an object as this," urging however, in the following paragraph, that it would be "very desirable for *moonlight*, or evening scenes, and for the ASTRONOMER would be of the greatest use."

Many of your readers, myself amongst the number, cannot understand, hence cannot appreciate, these observations; therefore, without presuming to be hypercritical, I would request some explanation, as to how Artificial light can be rendered available to Astronomers, or in an Astronomical point of view? Whether Mr. Haines proposes to "gild refined gold, &c," or, in other words, whether he proposes to illuminate the moon; to add brilliancy to the starry host; or what he really does intend us foggy Cockneys to understand?

As *utility* is the term on which Mr. Haines lays his primary stress, I, as an eye-witness of Mr. Moules beautiful productions, would refer him, and all interested in this progressing science, to a case of Portraits now exhibiting at the South Kensington Museum, taken by the Patentee, by Night, by Artificial Lights, which for detail, diffusion and brilliancy, far exceed any daylight Pictures yet produced by the "*sun's great and best light.*" These rare evidences of the progress of Photography under a new aspect give a decided negative to Mr. Osborne's remarks, who will find that the "great *desideratum*," a strong diffused light, has been completely obtained, and that every requirement in the Portraits alluded to has been happily and triumphantly realized.

But it is very evident, from this gentleman's style of prejudging, that he cannot be acquainted with the *modus operandi* attaching to the production of pictures by Artificial Light. Looking however at these gentlemen's remarks and opinions abstractedly, I trust, for the sake of science, that I may infer they are actuated by an earnest desire for extended results in this most interesting research, hence I will take the liberty of pointing out to them a phase under which I view the indefatigable talent and ingenuity of Mr. Moule, the patentee of this process, as an answer in full to Mr. Haines' *cui bono?* Thus then it is:—In addition to his own unsurpassed productions, Mr. Moule places the same facility of production within our own grasp, enabling us, when the sun is lost to us, to carry out in the evening, "at the 'witching hour of night," after the business of the day has ceased, a magical and delightful relaxation and recreation, which may be made either subservient to experiments, or to the more matter-of-fact purposes of Photography in all its ramifications except out-of-door scenery. As to portraiture, I again most emphatically assert, that for definition and brilliancy, this process exceeds all daylight effect. Photography has been vilely prostituted in the hands of a host of unscientific tyros; here is the antidote to the Quixotism and quackery of pretenders; the manipulation involves care, thought, analysis, and that reflection only native to philosophic and scientific minds.

I do trust therefore, as the Editor of a most useful journal, you will view, with your usual enlargement of mind, my remarks, as falling within the legitimate purpose of its pages; and, by inserting the above, convince your readers that "Palmam qui meruit ferat" is your motto.

R. M. PARKER, H.M.C.
(Amateur Photographer.)

8, James Place, Hackney Road.

—The uses of Artificial Light in Photography are certainly very important, and Mr. Moule is entitled to the thanks of Photographers for what he has done in this direction. It is evident that if a professional photographic portraitist can take *presentable* portraits at night, by Artificial Light, he will be likely to extend his business considerably, but it appears to us that this mode of operating is not without its difficulties. We have received from Mr. Moule a large case of his compound for producing artificial white light, and not a word can be said against the composition. It gives a brilliant light, but one which requires a good deal of management in order to give softness and roundness to the object illuminated. There is a great tendency to "soot and whitewash" in the lights and shadows, which must be met by the judicious arrangement of reflecting screens, for nothing is so offensive as hard blacks and whites in a photograph. Besides which a strong flaring light going off nearly in front of the eyes of the sitter is as likely as sunshine would be to distress the eye and spoil the expression of the features. If Mr. Moule has, as our correspondent states, succeeded in producing as successful portraits by artificial light as by daylight, we strongly advise him to publish his mode of proceeding without delay. Nothing is now more wanted by the host of professional photographers who have adopted the positive collodion process than some simple and intelligible directions for throwing the light on their sitter and arranging their glass room. If a successful professional photographer would discuss this subject popularly, and at the same time scientifically, in a pamphlet properly illustrated, we have no doubt that thousands of copies would speedily be sold. We are among those who hail everything in the shape of progress with enthusiasm, and we promise the cordial support of this Journal to any work which is calculated to instruct the tyro, or push the applications of photography in new and useful directions; but nothing is gained by exaggerated statements of the merits of any new discovery, and it will always be our endeavour to place a thing in its true light before our readers. [ED. P. N.]

TRANSPARENT STEREOSCOPIC PICTURES.

To the Editor of Photographic Notes.

DEAR SIR,—The beauty of these pictures, and the interest which is attached to all processes for producing them, have induced me to communicate the method described below; and if you think it of any value it is heartily at your service.

Take a plate of finely-ground glass and coat it on the unground side, with *any old Collodion* that will give a thick creamy film, and excite in a bath strongly acidified with acetic acid. Drain closely, and immerse in a dish of distilled water. Let it remain a few minutes and then lift it up and let it down a few times in order to wash thoroughly; hold it near the fire to dry; expose any time you like, from one second to two; moisten the plate in the washing bath and develop with

Pyro-gallic acid..............	2 grains
Citric acid.....................	1 grain
Water............................	1 oz.

Add 10 drops of nitrate of silver solution (not that used for exciting) to the quantity of developer, sufficient for the size of the plate, and pour on. If the exposure has been well timed the development proceeds rapidly, and the picture is fully developed before the solution becomes discoloured. Fix with a rather weak solution of cyanide of potassium, and wash well.

It will be seen that there is no novelty in this process; nevertheless I think it greatly superior to and less troublesome than the albumen methods.—The chief disadvantage is, that you must have a fire to dry the plates, and I don't think that they will keep more than a few hours after they are dried. My advice to those who think of pouring on some "preservative solution" is, do not. I have tried nearly all the "preservative solutions" under the sun, and find them only vanity and vexation. I confidently recommend the process I have described; the lights are quite pure, and the shadows a dense, rich black. I must caution those who may try it that they must use distilled or the purest rain water for the washing bath, and the same bath will wash several plates.

"A Photographic Fellow."

P.S.—I have not stated the quantity of acetic acid required, but you must have a good dose:—if a horizontal bath be used only a small quantity of silver is necessary.

I should like to know your opinion of citric acid for the calotype process, and how much ought to be used. It is as good an article as could be desired for negative Collodion in the proportion of 1 grain to 1 oz. pyro-gallic solution.

—The process is no doubt very good. Old collodion, in which the pyroxyline has undergone a little decomposition, may be used in the dry process without any after application of gelatine. This point is worth attention. We cannot speak with any confidence on the subject of using citric acid instead of acetic in the paper negative processes, but hope soon to be able to state the results of experiments; it would be a great blessing if citric would really answer as well as acetic in all the processes. One grain of citric acid appears to be equivalent to one scruple of glacial acetic, in photography. It contains a much greater excess of oxygen than acetic. Lemon juice contains about 5 per cent of citric acid; it may therefore be substituted for acetic acid, in equal quantities, by measure.

We are having a copying camera made for printing transparencies by *wet* collodion. We saw in London some transparent stereoscopies of Egyptian ruins, &c., by Mr. Frith, which are really superb. They are finer than anything of M. Férrier's, if that is possible. Messrs. Negretti and Zambra, of Hatton Garden are agents for them. [Ed. P. N.]

ON MOUNTING LENSES.

To the Editor of Photographic Notes.

Dear Sir,—I take this opportunity of thanking you for your spirited defence of what I consider to be the true optical principles of the camera, against the errors sanctioned, unfortunately, by Sir David Brewster.

There is, however, one point on which I do not agree with you, on which, perhaps, you will permit me to explain my views; for I am sure that it is your object to get at the truth. In No. 42 of the *Notes*, in some remarks on a letter of Mr. Howlett's you attribute the concentration of light in the centre of the pictures taken by him, to reflection of oblique rays, by the tube in which the lenses are mounted. Now, it appears to me, that if such reflection did take place, its only effect would be *a fogging of the picture*, and not a concentration of light. In fact, I should object to the term "concentration of light in the centre," because it is really *a diminution of light towards the edges;* much the same thing, you will say, but the latter term gives the explanation of the fact, whilst the former does not. Take the focusing glass from the camera and place the eye in its plane; on moving the eye towards the sides of the camera, you will find that less of the front lens is visible through the back one; hence, less light is, of course, allowed to pass. If the camera be large enough, you will find that at last, no ray reaches the eye through the lenses. This will partly explain the advantage of having the back lens larger than the front one; and will shew that there is no need of altering the present mode of mounting.

Rev. R. K. E.

—We thank our correspondent for his remarks, and stand corrected in the use of the term "concentration of light in the centre of the picture." In an early number we shall give a diagram of the present portrait lens, and shew how the tube acts by reflecting a portion of the oblique pencils. In the mean time a word or two on the subject may be intelligible without a figure.

The back and front lenses of a portrait combination being of equal size, it follows that every ray of a large direct pencil incident on the front lens, finds its way to the focus, on the focusing screen, while in the case of an oblique pencil a *portion* only of the rays come to a focus, and the rest are reflected by the inside of the tube, pass through the back lens, and impinge upon the picture. Now the part of the picture upon which they fall will depend upon the obliquity of the pencil. If the pencil has an obliquity of from 12° to 15° the reflected rays from the tube will fog the *circumference* of the picture, as in the case of Mr.

Crookes's "Waves;" but if the obliquity be not so great, the *centre* of the picture will be fogged, as in the case of nearly all the portraits taken by Mr. Fenton in the Crimea.

In addition to this effect of fog, from reflected light, it happens that as a portion, say one half, of every extreme oblique pencil is cut off and never reaches its proper destination, but goes somewhere else, the outside of the picture receives too little exposure when the centre has had enough.

In the case of Mr. Howlett's instantaneous views, taken in Jersey, the stop was placed *between* the lenses, which prevented fog, and the back lens was larger than the front. The arrangement was therefore not far out, and the result very good indeed. We can imagine nothing finer than the lens, (one of Ross's), used by Mr Howlett on that occasion. With an aperture of 2½ inches, and an equivalent focus of about 15 inches, it covered a picture 12 × 10 very tolerably; and had the plate been the segment of a sphere instead of a plane, there is no doubt but that a field of 40° would have been covered as sharp to the edge as in the centre. Now that foreign opticians are making a great stir about a new lens, we think it only right and fair to call attention to what has been achieved by an English optician, to whom photography is greatly indebted; but if that gentleman were only half as experienced a practical photographer as he is a practical optician, and had worked in this bright and sunny Island of ours, during one season, we feel sure he would very speedily modify, or altogether abandon, his present mode of *mounting* his truly excellent glasses.

[Ed. P. N.]

"*Outlook.*" The Stereoscopic Company are agents for Messrs. Lèrebours and Secretan, and will give you the information you require.

[Ed. P. N.]

"*Mr. O'Toole,*" of Armagh, enquires how to do away with the dark shade under the chin, in taking portraits of children and ladies. He should lay a light coloured oil-cloth, or white crumb cloth on the floor of the glass room, or hold a newspaper in such a way as to reflect a little light upwards, and cause the principal light to fall more horizontally on the face of the sitter. [Ed. P. N.]

"*J. L.*" will find the information he requires in our Treatise on the Positive Collodion Process.

[Ed. P. N.]

"*J. L. F.*" is referred to Mr. Howlett's article in No. 42. We have not yet tried "Skaife's Camera Shutters," but our impression is that an instantaneous mode of uncovering and covering the lens would be preferable. [Ed. P. N.]

"*Gabriel Davis*" enquires why collodion positives do not keep their colour, but turn brown. We shall be glad to hear the experience of other correspondents on this subject. [Ed. P. N.]

☞ In our next; *Mr. Barnes, on Dry Collodion; W. E. Holmes, on a Panoramic Camera; Dr. Nash; Young Photo; an Old Subscriber; Thos. Gulliver; and the conclusion of Mr. J. Gutch's paper. Also the Replies to Count Wengierski; R. Linsley; J. J.; Photo; a Jersey Amateur; Constant Reader; an Amateur; Delta; L. M.; J. Barr; Enquirer; Ignoramus and Subscriber; T. B. P.; T. Symonds; D. H.; &c. &c.*

☞ *Subscribers by the quarter will be kind enough to observe that this number is the* last *of the first quarter. They must therefore remit again, or delay will occur in forwarding the next number.*

Photographic Notes.

APRIL 1, 1858.

We have received some more positive prints in carbon, from the correspondent to whom we alluded in our last number: Mr. John Pouncy, of High West Street, Dorchester. By a curious chance, a few days ago, Mr. Henry Polluck, son of the President of the Photographic Society, happened to call on Mr. John Pouncy, during his absence from home, and saw in his studio some carbon prints, with which he was much struck. This led to a second visit, in which our correspondent and Mr. Polluck had a conversation as to the best means of bringing the process forward, exhibiting specimens, &c., and we believe Mr. Polluck's advice was pretty much the same as our own. With respect to the merits of the process: the second lot of prints forwarded to us are very good, and the whites remarkably clean and pure; but there is a little want of half tone, possibly from the too great density of the negatives, and the blacks are rather too green, or grey, and want more freshness and vigour. But these are faults which may no doubt be remedied. It is scarcely reasonable to expect that the first specimens of an entirely new process should be as good in artistic qualities as prints by a process which has been in use for many years, and the manipulation of which is well understood. Everything must have a beginning, and it rarely happens that perfect success is achieved at once. We are sure there are many printing processes already published, (Sir John Herschell's Crysotype, for instance), which are far better than the common silver printing process, and which a little perseverance in the right direction would perfect, and bring into general use. But of all printing processes which we have seen or heard of, there is none, in our opinion, so promising as this new method of printing in carbon; and we confidently predict, that before three months have passed, it will produce a revolution in positive printing.

Our correspondent has not communicated the process by which his results were obtained; but we intend, very shortly, to resume our own experiments in carbon printing, the clue to which was given in *Notes*, No. 42, and if that process should lead to anything good and presentable, we shall again call attention to it. It is not unlikely that ammonio-citrate of iron might be substituted for bi-chromate of potass, and if with a compound of an iron salt, lamp black, and glue, really good and permanent positives could be produced, the simplicity and economy of the process would be something delightful. Besides, a great variety of colours might be substituted for black, perhaps with an equal chance of permanence. Our hint in *Notes*, No. 42, opens an entirely new field of research, and we predict that before long the matter will be taken up in earnest by the Trade, and bottles of different photographic pigments, with appropriate cleansing solutions, offered for sale, as well as blackened or tinted sensitive papers. Positive printing will then be a very simple and mechanical operation, and the photographer may vary the tint of his prints at pleasure, without fear of their fading, or turning yellow, or becoming covered with sickly spots. In fact, the abominable process at present employed will be swept away, and superseded by another, which will satisfy both the artist and chemist.

Our readers may smile at these predictions and think us too enthusiastic, but if the truth must be told, we rather pride ourselves on the PRACTICAL character of our suggestions, and assign three months, as the probable date of the fulfilment of the predictions now committed to print. *Nous verrons.*

At the last Meeting of the French Photographic Society, the proceedings of which are reported at page 88, some very interesting matters were brought forward, on the subject of which we have our own experience to add, and some remarks to offer.

The first topic is that of producing a dense and satisfactory *negative*, with half the usual exposure in the camera, that is, with the exposure usually given to a collodion *positive.*

The collodion and nitrate bath being the same as usual for negatives, and the plate exposed as for a positive, the development is effected by either of the following methods:—

1st Method.—Pour over it a saturated solution of gallic acid. A little alcohol added, makes it flow better over the film. Leave the solution on a few seconds, then pour it off into the measure. No image yet appears. Next, add to the gallic acid in the measure a few drops of a solution of acetate of lead in distilled water. The strength is not material; say 20 or 30 grains to the ounce. The gallic acid immediately becomes milky. In this state, pour it again over the plate. The image appears at once, and may be sufficiently intensified, and all the details brought out, in from five to ten minutes. Fix and finish as usual.

We have tried this process, and it answers perfectly. The negatives are of a rich brown

tint, and extremely dense, and full of detail, with beautiful definition. The process would, very likely, answer well with Dry Collodion, and we commend it to the notice of the excellent Doctor whose advertisement adorns our title page, and of all who employ the valuable process which he has discovered and published. If with this developer, the time of exposure of a dry plate could be reduced one half, or even more, a great point would be gained, for the insensitiveness of dry collodion is its greatest, and in fact only drawback.

2nd Method.—Develop the picture in the following manner :—

While the plate is in the nitrate bath, pour into a chemically clean measure a solution of photo-sulphate of iron, strength about five grains to the ounce of water, and add to it, from another measure, about as much glacial acetic acid by measure as there is iron by weight, or perhaps rather less. Stir well together. After exposing the plate as for a positive, develop with the above solution, pouring it gently, evenly, and quickly over the plate. A little alcohol makes it flow better, but is not necessary. The image comes out without fogging, and the development may be pushed for several minutes, in exactly the same way as with pyro-gallic acid. No silver need be added, if the chemicals work well. A magnificent negative, exquisite in definition and gradation of tone, and of any amount of density, may be produced in this simple way. We have experimented considerably with the process, and are delighted with it ; so much so, that we have cancelled an order for a fresh supply of pyro-gallic acid, and think it very doubtful whether we shall ever again employ that expensive chemical. Citric acid may be substituted for acetic, with equally good results, remembering that one grain of citric goes as far as one scruple of glacial acetic acid. The great secret of obtaining density and vigour in the negative is to add the acid to the developer immediately before using it, as described. A developer which has been mixed for 24 hours, does not answer so well.

We are glad to see that Mr. Hardwich is experimenting in this direction, and that he has already thrown out some valuable hints. It is quite possible that proto-acetate of iron may be better than proto-sulphate, and if so, photographers will be indebted to him for another valuable suggestion.

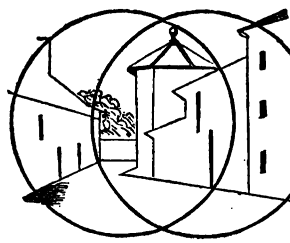
Negatives developed with iron are brown, and not blue like those developed with pyro-gallic and citric acid.

A-propos of citric acid. Those who find it more convenient to travel with a *little* bottle of *crystals*, than with a *large* bottle of *liquid*, and who prefer using a solid which only costs one-fiftieth part of the liquid, may substitute citric acid for acetic, with perfect confidence. The negatives are quite as good, if not better, and the manipulation is in every respect the same. We feel quite justified now in speaking with confidence on this point, having proved the thing experimentally, again and again. The remark however applies to collodion, not to paper. Citric negatives are blue and not brown, and the colour allowing the actinic rays to pass through, the prints exhibit more half tone, and less "soot and whitewash." The photographer is a little taken in in the printing, and the deception is so much gain to him. Citric acid preserves the purity of the lights better than acetic.

The other topic introduced at the last Meeting of the French Society was a novelty in the construction of the Stereoscope. M. Ferrier, a high authority in this matter, exhibited a stereoscope constructed by M. Hermagis, in which WHOLE LENSES, placed with their centres $2\frac{1}{2}$ INCHES APART, are substituted for half lenses, or prisms, or whole lenses with their centres wider apart than the pupils of the eyes, (Mr. Erskine Scott's principle); and he stated that this new instrument constituted a veritable progress in the science of the stereoscope. "Selon moi," said M. Ferrier, "ce nouvel instrument constitue un véritable progrès dans la science de la stéréoscope."

But this instrument is NOT a new idea. Does not Mons. Ferrier know that this "nouvel instrument," possessing 1, 2, 3, 4 notable advantages, and which we, the true inventor, have called the "VERITY STEREOSCOPE," was described in No. 30 of this Journal, nine months ago, and the whole mathematics of it discussed, and established as firmly as any other geometrical truth? If this article has been overlooked,—mistrusted,—pooh-pooh'ed,—derided by an eminent philosopher as the vagary of an ignorant Cambridge graduate, whose optical notions might be overturned by any "male or female tyro" in science, let us now once more call attention to it, for it contains the TRUE explanation of the theory of the lenticular stereoscope, and suggests the only form of the instrument which ought to be constructed. We do hope that a certain eminent philosopher will now see that he has been for years holding and inculcating wrong notions on this subject,—that the displacement of the images by *half* lenses is unnecessary, and erroneous in principle,—and the box with its *tubes* a bungling contrivance. We speak feelingly, having lately invested fifteen shillings in one, which introduces two

black intersecting circles, into every picture viewed through it, as shown in the following woodcut:—



Now that the true principles of the stereoscope are likely to be better understood, we do hope that a certain eminent philosopher will call in all the unsold copies of his Treatise on this instrument, and bring out a Third Edition at once, repudiating the errors that are to be found in the first (that is to say, nearly the whole book), and using the influence which he possesses with an enlightened public and enlightened opticians, to induce them to have nothing more to say to the box with the semi-lenses and tubes, which he invented, and to make a fresh start with the VERITY STEREOSCOPE, the principle of which has so much pleased M. Ferrier, and which must ultimately supersede every other form. In the meantime we shall prepare another article on this subject, and endeavour to state the whole truth of the matter in a popular and intelligible manner,—premising now that a pair of stereoscopic pictures cannot be united by whole lenses 2½ ins. apart, unless the right picture is cut off by a partition from the left eye, and *vice versa*;—in which lies the whole secret of the matter. We would observe also that Mr. Erskine Scott, of Dundee, takes particular pains in his Specification to repudiate the theory which we subsequently advanced, and we wish it to be understood that we equally repudiate the principle on which his Patent Stereoscope is constructed. So far from agreeing in this matter with Mr. Scott, as Mr. Negretti supposes, we differ from him entirely. The following is an extract from Mr. Scott's Specification, which will settle this point at once :—

"Heretofore in the construction of refracting stereoscopes it has been usual to employ eye-pieces consisting each of half, or a smaller portion, of a double convex lens; but in some cases refracting stereoscopes have been constructed, having eye-pieces of two entire lenses, placed at such a distance apart that the observer looks through the centre of them, &c., &c." (?).

"Now, my invention consists in the use of eye-pieces composed of two entire lenses, placed so that their centres are at a *greater* distance apart than the eyes of the observer, &c., &c."

Mr. Scott's invention is therefore inconsistent with our theory, which does not consist merely in using whole lenses, *but in putting their centres at the same distance apart as the eyes.*

A few words now about the Orthoscopic Lens. We have thoroughly tried it, and returned it to Messrs. Knight with some negatives taken with it, which they will no doubt shew to their customers. On the whole we consider the lens a very good, useful instrument. It works very clean to the edges and allows no diffused light to enter, even when pointed at the sky. We took three or four skies with it in from four to ten seconds with a half-inch stop, and have never seen cleaner or better skies, although no shade was used to the lens. The article in which we have traced the course of an oblique pencil through the Orthoscopic Lens is ready, but must be deferred to the next number, from want of space. In this article, which is illustrated by a diagram, we have explained why the oblique pencil has a longer focus than the direct pencil, which is an elegant property of the arrangement, and one the discovery of which does M. Petzval great credit. If our readers have not already demonstrated this property, they will be much pleased with the mode of proving it, which is very neat. On the whole we do not hesitate to pronounce the Orthoscopic Lens a very excellent and useful instrument, and superior to the ordinary view lens in all respects but one, viz: flatness of field; and even in this respect there is but little difference between them.

Since writing the foregoing remarks on the development of negatives with iron, we have received for insertion the following interesting letter from Mr. Hardwich :—

DEAR SIR,—In a late number of the *Notes*, I see mention made of a series of stereoscopic pictures, taken by Mr. Wilson, of Aberdeen, which, after praising them highly, as amongst the best you have seen, you state were developed with the *sulphate of iron*, in place of pyro-gallic acid. Now that the season for out-of-door work is close at hand, I trust that you will lend your able pen to the advocacy of a more extended trial of the salts of iron as developers for collodion negatives, since I am persuaded that they will, in many cases, produce a better picture with a shorter exposure, than could be obtained by the aid of pyro-gallic acid.

Some few days since, I spent a morning with a friend, in one of the metropolitan cemeteries, with a view of photographing some of the principal monuments. We found however, that they were difficult to copy, and with an ordinary developer, it was almost impossible to bring out the dark cypress trees in the background, without con-

founding the distinction between the marble and and the sky, by excessive density in the deposit of silver on the high lights, as they may be termed, of the negative. Everything appeared favourable for the employment of sulphate of iron, and accordingly having measured out about two drachms of a solution of that salt, (twelve grains to the ounce, with thirty minims of glacial acetic acid), it was poured over the plate. The image appeared quickly, at first red, then black, and in about thirty seconds, the negative was complete and ready for fixing. On holding it against the light, the gradation of tone was perfect, and a white marble urn was seen standing out plainly against the sky. Foliage in the foreground, being at the same time clearly defined.

The idea which many entertain of sulphate of iron, is that of a developer, producing a weak and silvery image, and in certain states of collodion and bath, such no doubt is the case. In other conditions, however, it is not so. You speak, in a letter lately received, of some experiments you are making with a pyroxyline prepared at high temperatures, which dissolves abundantly in ether and alcohol, yielding a fluid solution, and producing a collodion which gives great intensity of image. This I may observe is the kind of collodion which is proper to be used with sulphate of iron as a developer, and with a short focus lens, of full aperture, in a good light, it will give very dense negatives, without any addition of silver. Even with a lens of longer focus, and in comparatively dull weather, there will be seldom any difficulty in getting up the intensity, if a little acetate of soda be previously added to the solution of the sulphate.

At the present season of the year, when the actinic power is nearly at its maximum, excessive development in the parts most exposed is always to be feared in taking stereoscopic negatives. This may effectually be remedied by modifying the collodion, but experience has taught me, that a sensitive, but *feeble* collodion, does not, as a rule, succeed well in the hands of amateurs; whilst to those who copy objects of still life, with lenses of very long focus, it is quite useless. Hence, to prepare a collodion which shall succeed for all purposes, it must be made as above described, with especial reference to flowing qualities and to intensity, and the other desiderata must be supplied by the distance. If, for instance, the half tones are slow in coming out, a stronger reducing agent must be used, such as the sulphate of iron, which will often cover a plate with fine detail, when pyrogallic acid develops nothing. In very hot weather, the case may be different, because heat is favourable to reduction, but at ordinary temperatures, a single trial will prove the superiority of the sulphate, in giving a picture, after a short exposure.

It is however very important that the bath should be distinctly acid with acetic acid, since sulphate of iron at once fogs a plate prepared in an alkaline bath. Be careful also not to allow any white light in the developing room, as the sulphate will assuredly detect it. With these precautions, and a little extra care in pouring on the solution over the film, there will be no difficulty. The smaller the quantity of developer used, the better, as the nitrate is thereby economized, and the whole of the silver precipitated directly upon the image. Those who wish to obtain good negative portraits and stereographs, with an intense sample of collodion, should assuredly try the use of the salts of iron, as developers. F. HARDWICH.

Kings' College, March 22nd.

Several correspondents have kindly sent us photographs of the Solar Eclipse, of the 15th ultimo. One, by Mr. Wilson, of Aberdeen, is extremely fine. In Jersey, a heavy mist came on, which completely obscured the sun during nearly the whole of the phenomenon. But the most remarkable astro-photographs ever taken, are said to be those of the eclipse, taken by M. Quinet, in the instrument of M. Porro, at Paris, the object glass of which is about 50 ft. in focal length, and 2 ft. in diameter. (See "La Lumière," March 20.)

SECOND COMMUNICATION, ON A NEW ACTION OF LIGHT.

BY M. NIEPCE DE ST. VICTOR.

In our last Number we mentioned that M. Niepce de St. Victor had presented to the French Academy of Sciences a second Paper on the subject of a supposed new action of light discovered by him. The following is an analysis of this communication:—

There are two ways of exhibiting the newly discovered action of light on bodies which have been exposed to it. The first has been already described, (see *Notes*, No. 41); the second is as follows:—

Take a sheet of paper which has been kept for some time in the dark; lay a negative upon it, and expose it to sunshine for a suitable time. Then, in the dark room, apply a solution of nitrate of silver to the paper, and the parts impressed by light will darken. The picture thus produced, may be fixed by simply washing it in distilled water.

Query,—in this experiment does the light really become latent in the paper, as M. Niepce supposes, or does it produce in the paper, or the sizing, some *chemical* change which causes the subsequent decomposition of the nitrate of silver? If the latter supposition be correct, the experiment is merely a case of common photography. [ED. P. N.]

An image, more quickly developed, may be obtained by immersing the sheet of paper, before exposure, in some solution which increases its power of absorbing light. Nitrate of uranium is a substance which communicates this property. Make a moderately strong solution of this salt. Immerse the paper in it; dry it in the dark, and expose it to light under a negative, say for a quarter of an hour, in sunshine. Then, in the dark room, apply to it a solution of nitrate of silver, and the image instantly appears. It may be fixed by

washing, as before, in distilled water, which removes the undecomposed salts of silver and uranium. The print may then be toned, by treating it with a solution of acid chloride of gold. Or the same result may be obtained, by applying to the paper, after exposure, a solution of bi-chloride of mercury, rinsing it in distilled water, and then applying the nitrate of silver; fixing as before. In this way, fine blacks are obtained, but the exposure must be three times as long as in the former experiment.

Another mode is, after exposure to light, to apply to the paper a solution of acid chloride of gold. The image comes out immediately, and is of an intense blue colour. It may be fixed by simple washing, as before.

Positives printed in this way, by means of a salt of uranium and one of gold, silver, or mercury, resist without fading, the application of a boiling solution of cyanide of potassium. Aqua regia is the only substance which destroys them. The important problem of the absolute fixation of photographs, appears therefore to be solved by these simple methods.

These processes are not new, nor do they demonstrate any new action of light. They are merely processes of common photography. The nitrate of the sesqui-oxide of uranium is a well-known photographic agent. It is de-oxidized by light, and converted into proto-nitrate of uranium, which proto salt has the same property of decomposing solutions of silver and gold as the proto-salts of iron; a metal to which uranium bears a strong analogy. The processes in which a uranium picture is developed by silver or gold were communicated to this Journal, about a year ago, by Mr. Burnett. See pages 99 and 100, *Notes* No. 23, for March 15, 1857; and observe where Mr. Burnett says, "I have succeeded in getting very beautiful impressions by development of the uranic papers by chloride of gold alone, &c." See also our Editorial remarks in the Leader of No. 27, for May 15, 1857, in which we allude to the probable permanence of prints produced by uranium and gold. We are really amazed at the simplicity of M. Niepce de St. Victor; for the principle of these processes was explained by Sir John Herschell many years ago. To suppose any "new action of light" in these cases is surely absurd.

We feel certain that mere washing with water will not fix proofs obtained by these processes. Lignine combines chemically with a great number of salts, and among them with the salts used in the above processes. The prints will certainly change colour in the lights unless some more energetic mode of fixing than mere washing with water is employed. [ED. P. N.]

M. Niepce then observes that the nitrate of uranium may be replaced by a simple solution of tartaric acid; [Mr. Burnett found the tartrate of uranium, the most energetic salt of that metals; but the exposure must be increased, and the development by nitrate of silver may be *assisted* by heat, which is *necessary* when the gold developer is used.

A drawing traced on a sheet of cardboard with a solution of nitrate of uranium or tartaric acid, exposed to sunshine, and applied to a sheet of sensitive paper, impresses an image much more intense than when sulphate of quinine is used, as formerly described. The most intense impressions obtained with sulphate of quinine in former experiments, were when it was dissolved in tartaric acid. A hot plate, applied to the exposed cardboard, greatly accelerates the action, and when the lines of the drawing are thick and strong the sensitive paper need not be placed in actual contact with the exposed cardboard.

The experiments on light stored in tubes, are much more striking when the paper which lines the tube has been steeped in tartaric acid, or nitrate of uranium, but especially tartaric acid, which reduces the salts of silver and gold less readily than nitrate of uranium, but gives a stronger radiation.

Query,—may these experiments with the tube be explained thus:—The uranic or tartaric paper which lines the tube is deprived, by light, of some of its oxygen; this it gradually recovers at the expense of the aqueous vapour within the tube, which is decomposed, and hydrogen set free, which would develop the image exposed to its action. However improbable this may at first appear, it is certainly more probable than that light, which is but the undulation of an imponderable ether, and not a material substance, should be stored up for an indefinite time in a sealed tube. [ED. P. N.]

When the paper lining of the tube is moistened with water immediately before applying the tube to the sensitive paper, and a moderate heat applied, the impression is much more quickly obtained.

This greatly favours the idea of the decomposition of aqueous vapour by the insolated chemicals, and the consequent liberation of hydrogen, which, by combining with the chlorine of the chloride of silver darkens it by producing hydro-chloric acid and sub-chloride of silver. [ED. P. N.]

The salts of uranium are fluorescent, according to Mr. Stokes, and the crystallized nitrate of uranium becomes phosphorescent by percussion; but tartaric acid is neither fluorescent nor phosphorescent. The remarkable property which M. Niepce supposes these substances to possess, of becoming saturated with light, is not therefore due to either of the above properties.

There are many other substances which possess, in a greater or less degree, the same properties. In the former class are, citric acid, oxalic acid, sulphate of alumina, citrate

of iron, iodides and bromides, arsenious acid, tartrate of potass, lactic acid, and skin; all of which exhibit the properties described as belonging to tartaric acid and nitrate of uranium. In the second class are, sulphate of quinine, alcoholic tincture of chloro-phylline, datura stramonium, curcumine, æsculine, sugar, collodion, gelatine, and starch. In fact, the substances which best preserve their activity due to insolation are, with the exception of the salts of uranium, the least disposed to fluorescence. In the third class, the chlorides, acetate of morphia, phosphate of ammonia (which gives fine blacks when developed with nitrate of silver), prussic acid, and quinate of lime and morphia, which gives chesnut browns.

The activity produced in bodies by insolation depends on the amount of exposure, state of humidity of the atmosphere, &c.; but it has certain limits, beyond which no increase of effect can be produced.

A body, rendered active by insolation, preserves for more than a day, in darkness and exposed to the air, its property of acting on the salts of gold and silver. This property is ultimately lost, but may be renewed in those cases, in which the chemical composition of the exposed substance is not altered by light, as in the case of the iodides and bromides.

How entirely this remark bears out the idea that in those cases in which light acts simply as a *de-oxydizing* agent, (in the uranium salt for instance), a per-salt is again produced by exposure to air after insolation, and the original property recovered; while, in the case of the iodides and bromides, in which light acts by combining the iodine or bromine with the hydrogen of the aqueous vapour in the air, the original property of the substance is destroyed, and cannot be recovered by subsequent exposure to air. [ED. P. N.]

Uranium paper possesses a remarkable property. It is coloured by light, and decolorized in the dark, after a few days; after which, it may be coloured again, and so on, alternately.

Many substances, both organic and inorganic, are acted on by an insolated body, in the same way as the gold and silver salts. Bi-chromate of potass is rendered insoluble; but bitumen of Judea is not affected by contact with an isolated uranium or tartaric paper.

This is easily explained. Bi-chromate of potass *parts with* oxygen to the uranic salt reduced by light; but bitumen of Judea is not an oxydizing body. When exposed to light it is oxydized, and not *de*-oxydized like nitrate of uranium or bi-chromate of potass. It has a tendency to *acquire* and not to *part with* oxygen. [ED. P. N.]

It remains to be seen, whether a mixture of hydrogen and chlorine, can be combined by the light supposed by M. Niepce to be radiated from a body after insolation. An engraving, moistened and insolated, is reproduced by contact with sensitive paper; but if it is covered with a thin layer of water, it is not reproduced, even in a salt of uranium or tartaric acid.

Gelatine, mixed with a salt of uranium, and exposed to light, is rendered insoluble, as if it had been mixed with bi-chromate of potass.

The whites of an engraving, which has been impregnated with a salt of uranium or tartaric acid, are easily reproduced, after insolation, on a sensitive chloride paper; but the blacks produce no effect. The same thing occurs with a drawing in ink, or a sheet of paper blackened with smoke.

It would be curious to study the action of the solar spectrum, upon a paper impregnated with tartaric acid, which is not fluorescent, that is, does not become luminous under the action of the ultra-violet or invisible rays. Which are the rays, that after insolation, impress the image most strongly,—the most or the least refrangible?

This query of course involves the assumption that light is really absorbed and afterwards radiated. [ED. P. N.]

M. Niepce de St. Victor enclosed with his paper, some positives. printed by M. Victor Plumier, by the uranium process described; and observed that this process might be easily employed, and would be an advance greatly desired.

Once more we would observe that this supposed new process of M. St. Victor's was published a year ago in this Journal, and no credit is therefore due to that gentleman for the publication of it. Like many other original things which our columns contain, it has been disregarded; but that does not signify; priority of publication brings to an inventor the credit to which he is justly entitled, and this is easily proved. Those who publish a thing as new which has already appeared in a public Journal put themselves in a ridiculous position, and their mistake is sure to be exposed. We have looked through Hunt's "Researches on Light," but Sir John Herschell's experiments described in that work do not appear to have included uranium. Our impression is, however, that his Crysotype process is just as good, and identical in principle with Mr. Burnett's uranium process. [ED. P. N.]

In conclusion, M. St. Victor describes the following process of reproducing engravings, by the vapour of phosphorus:—An engraving is exposed to the vapour of phosphorus burning slowly in the air. The blacks condense the vapour, the whites do not. It is then applied to a sensitive chloride paper. After a quarter of an hour of contact, the engraving is reproduced in phosphide of

silver, which, when sufficiently vigorous, resists the action of chemical agents employed to remove the chloride. If an engraving on India paper is laid on the sensitive chloride paper, and exposed to the phosphoric vapour, the vapour penetrates the whites of the engraving, but is arrested by the blacks. In this way, a *negative* impression may be produced. If the action is continued too long, the blacks also produce an impression.

The vapour of sulphur produces similar effects, but the image is not stable, being black sulphide of silver.

When sulphur vapour is employed, the paper should be coated with nitrate or acetate of lead, and not with chloride of silver. Sulphide of lead is thus produced, which is black and more stable than black sulphide of silver. [Ed. P. N.]

This second communication of M. Niepce de St. Victor's has produced in our mind the conviction that the experiments described in his first paper do *not*, by any means, prove the new property of light which he suspects. All the effects produced by insolation may, we think, be traced to the *chemical* action of light, and not to its absorption, and subsequent radiation by the substance insolated. In this second communication, there is really no novelty. The facts stated have been published before, and are well known to those who read attentively English photographic literature. [Ed. P. N.]

We have received for insertion the following letter from Herr Pretsch, on the subject of M. St. Victor's communication:—

"I was accidentally present at a part of the last Annual Meeting of the Photographic Society, and had therefore the opportunity to hear the excellent opening speech of the learned Chairman, and his allusion to M. Niepce de St. Victor's new discoveries in the peculiar properties of light. Although the *results* produced by light become visible enough, nevertheless we have few means to ascertain how the change is produced, by which light alters the property of certain substances. Permit me to mention here, out of my experience, some facts which came in my memory by the above mentioned allusion.

"Animal Magnetism, also known by the name of Electro-Biology, Mesmerism, &c., has occupied the minds of many learned men perhaps not less than the relationship of Electricity, Magnetism and Light; the change of Electricity into heat and magnetism; the change of Heat into Light. Baron Reichenbach has occupied himself many years, to ascertain, where, in what substances, and in what quality and quantity, there is contained what he called Od, or the invisible power by which persons are affected who are sensitive to the influence of Mesmerism. He himself not being sensitive, he has used for his investigations some other sensitive persons. He had furnished for this purpose a perfect dark room, in which sensitive persons were placed. In more or less time, according to the ability of the persons, they became able to see and feel the effects of the Od. Large magnets and pieces of crystal-stones (quartz) exhaled the Od in blueish or yellowish flames, corresponding to the north and south poles, and producing a cold or warm sensation upon those persons. He ascertained the effects of the sound of a bell, and of flowing water upon sensitive persons, and explained by these means, why some persons are able to find out flowing water under the ground by walking over it. His researches have been published in the form of letters about the "Od-Magnetism," and have been translated into English.

"Amongst his numerous experiments he had placed stones, and various other materials, in sunlight, and brought them, after being saturated with the rays of the sun, in his dark room, where those persons *would see* the light coming from or exhaled by these objects. It might seem strange or extravagant, but I think it is probable that sensitive persons, remaining a certain time in a perfectly dark room, might *see* the effects produced by the sun upon objects exposed in the way which has been explained by M. Niepce, and in this manner, Mesmerism might furnish us with some means to ascertain some of the wonderful properties of light.

"Paul Pretsch."

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, 19th February, 1856.

M. Gatel communicated his mode of taking negatives on albumenized collodion.

The process is a complication of M. Taupenot's, and we think a bad one, as iodide of iron is introduced. [Ed. P. N.]

M. Corbin stated that he had improved his process of taking negatives on collodionized paper, and could now substitute dry paper for wet, without any loss of sensibility. He said he did not intend to publish the process, as his prepared papers were to be an article of commerce, but requested the Society to allow a Committee to witness his manipulation and report results. This was very properly refused, under the circumstances.

MM. Davanne and Girard presented the first part of a general investigation of Positive Printing.

This paper is of great interest. We shall give a summary of it in the next No. [Ed. P. N.]

The report was read of a Committee, composed of MM. Bertsch, Foucault, and Bayard, to examine the merits of M. Voightlander's Orthoscopic Lens. The report was highly favourable. M. Voightlander, who was present at the Meeting, observed that he

could construct Orthoscopic Lenses of from four to five inches diameter, which would cover immense plates very satisfactorily.

M. Frank, of Villecholle, communicated a method of developing collodion negatives, by a mixture of gallic acid and acetate of lead, thereby reducing the exposure very considerably.

The process is as follows:—

Gallic acid, with acetate of lead added, forms one of the most energetic developers, and at the same time one of the simplest and most economical.

The plate being collodionized and excited, as usual, give only one half the ordinary time of exposure. Pour over it first a saturated solution of gallic acid; when it has been on a few seconds return it to the measure, and mix with it five or six drops of a solution of acetate of lead in distilled water, in the proportion of six per cent. The developer immediately becomes milky. Pour it again over the plate, and the image appears at once, and may be intensified to the proper extent in a few minutes; the negative being as good in all respects as one obtained in the ordinary way.

We have tried this process, and the results were perfectly successful. The development was rather longer than usual, but that appears to be the only drawback. The time of exposure may be considerably reduced, without losing any of the details. [Ed. P. N.]

M. Paul Perier offered some remarks on the employment of salts of iron in the development of negatives, and described the following process which has been employed for some time by M. le Comte Aguado:—

The plate being collodionized and excited, as usual, receives only the ordinary exposure for a positive, and a dense negative is then obtained by the following developer, applied in the usual way:—

Saturated solution of proto-sulphate of iron	100 parts.
Common water	500 ,,
Crystallizable acetic acid	20 ,,

It is not necessary to add nitrate of silver to the developer in order to strengthen the image. The picture is fixed and finished in the usual way.

We have experimented largely with this process, and find it an excellent one. See our remarks in the leader. [Ed. P. N.]

M. Ferrier presented, in the name of M. Hermagis, two stereoscopes constructed on a new principle; (viz: that described in *Photographic Notes*, No. 30). Whole lenses, achromatic and periscopic, are placed with their centres at the same distance apart as the pupils of the eyes. The advantages of this arrangement were stated by M. Ferrier to be:

1st.—By using the centre of the lens, there is no distortion of the image.

2nd.—The effect of relief is much more perfect and natural; and foreground objects, even when the distance between the stations has been a little strained, are united without difficulty.

3rd.—The magnifying power is much greater, and may be even increased, so that the image may appear remarkably enlarged.

4th.—You may, without fatigue, look through this stereoscope for several hours; which would be impossible with the common stereoscope.

"In conclusion," observes M. Ferrier, "THIS NEW INSTRUMENT CONSTITUTES A DECIDED ADVANCE IN THE SCIENCE OF THE STEREOSCOPE."

—On this subject, see our remarks in the leader. [Ed. P. N.]

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEAR 1856.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Continued from No.* 46.]

In the Spring then of 1856, I commenced the ' Summer's tour," and to the denizen of a crowded city, such as London, what a bright train of sunny scenes at once rush across one's memory, by the mere mention of those words,—for who is there that has not one lingering spark of love for the freshness and brightness of the country? Who is there who cannot recall to his memory a "Summer tour" with delight; to recount the happy days he passed, free from care, free from restraint, and the conventional forms of City life; free from the hurry and toil of business; health seeking, and health obtaining, both to body and mind; the only regret being caused, when the time of return becomes necessary? Once more to the business, and the matter-of-fact walks of life.

But to resume.—Taking the Great Western Railway, I commenced my journeying by a sojourn at Weston-super-Mare, or Weston-super-*Mud* as it is facetiously called. There is little to interest the photographer in this healthy watering-place, except perhaps the curious old Saxon porch of Uphill Church, and the Tower of Woodspring Priory, each of which will repay the trouble of a visit; twelve miles from Weston you readily reach Cheddar, quite worth a *day's* labour with the camera; the fine and lofty limestone cliffs which rise on either side of the road, to a great height, present an exceedingly beautiful appearance, and at Mr. Cox's little Hotel very comfortable and reasonable accommodation is always to be met with; an entire day was dedicated to Cheddar, and it is not too much to do it justice.

Returning to Weston on the following day, our next move was by railway to Highbridge, and by the branch railway to Glastonbury. At Glastonbury the views, although very fragmentary, are exceedingly beautiful. Of the Chapel of St. Joseph of Arenathea, though somewhat difficult to obtain good points of view, from its being so shut in by the lofty trees, is still worth any trouble to obtain. It is of great beauty. Be careful of the water in the well, at least for any photographic purposes, being strong chalybeate, and therefore necessarily very damaging. I spoiled one of my plates in using it; the celebrated Thorn is dead and gone. At some distance from the principal ruin is the Abbot's Chapel, quite worth while photographing, and which I mention, as in a hurried visit it might be overlooked; there is also a very fine old Church in the town, very near the Hotel, the George; (the views are exactly opposite the Hotel). The Abbey formerly extended over a space of sixty acres.

An omnibus conveys the traveller to the great city of Wells and its glorious Cathedral, of which many very beautiful views may be taken; the highly decorated principal entrance especially meriting notice; some very beautiful views are also easily attainable from the garden of the Bishop's Palace. Indeed there is no lack of subjects, and all to be taken without any fear of molestation or annoyance, for you walk the deserted streets of this dull town and scarce meet with any one. The Bell Inn, is a most comfortable, clean, and desirable Inn; a day should be spent here.

Taking the railway from Wells, we proceeded to Bridgewater, where we found the coach ready to convey us to Lynmouth; and to enjoy this lovely ride, by all means secure an *outside* place, and grumble not at the slow and lazy pace, for verily there is much to admire on every side, and to make one rejoice at the quiet pace instead of the hurry and rush of the railway. For really beautiful and thoroughly English scenery, I know of nothing to compare with the ride from Bridgewater to Lynmouth. Whether for the glimpses, here and there, of the coast and Bristol Channel, for the richly wooded scenery before reaching the coast, the Laartock hills bounding the horizon, the picturesqueness of Dunster and its quaint circular market-house; of Porlock and its harbour. The view looking from Rulnard Hill, and the ride to Porlock, are perhaps two as genuine examples of the characteristic, rich, luxurious, peaceful, and social scenery of dear Old England, as could possibly be picked out of the whole map. A new road that has been very recently constructed from Porlock is also very fine, and each zig-zag, that takes one higher and higher, displays some fresh beauty in the wondrous panoramic view that here meets the eye. How striking the contrast of all this luxurious and rich scenery, to that which meets the eye on arriving at the summit of the hill, where you commence the ride over Exmoor, a vast tract of dreary moorland, a sea of heaths and gorse, and hillocks of earth, broken here and there by a pool of dark brown peat-stained water, or deep hollow, whence the peat has been dug for. The road traverses the moor for several miles, and on a cold dull autumnal, or winter-evening, this blasted heath presents as melancholy and dreary a ride as can well be met with in merry England. Night shut out the glorious view from Canterbury Hill, which we were not sorry to find ourselves descending, somewhere about 11 o'Clock, the coach being the reverse of railway, as unpunctual in its arrival at Lynmouth as can well be conceived. It has certainly strange ups and downs to encounter, and how it escapes accident will strike every one who has travelled by it as something wonderful. The hill alone down to Lynmouth, and the one up to Lynton, were certainly never made for four-horse coaches, and especially when loaded, as it was, with passengers and luggage, on the night we travelled by it. By midnight we were comfortably lodged and housed in that most respectable of Inns, the Castle, at Lynton. We could hear the waves breaking many hundred feet below our window, and with their noise, and a tired frame, we sunk to rest, to awake the next morning to one of the most glorious scenes I think I ever have seen. I remember my delight in looking out of my window for the first time, on the Lake of Geneva, and for the second time in my life experienced a similar thrill of delight in looking from our window of the Castle Inn, at Lynton, on the scene below. It was one of those glorious, delicious mornings in August, the air redolent with the scent of mignionette and flowers, which were growing in wild luxuriance in the garden below our window. Every thing looked bright and cheerful, the room clean and gay, the furniture bright and nice; and then those glorious cliffs of old red sand-stone, and the Sea, sparkling under the morning sun, and breaking in long wreaths of white foam on the shore below, was a scene worth coming any distance to see, and which once seen is never effaced from the memory.

To be concluded in our next.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

PHOTOGRAPHY BY ARTIFICIAL LIGHT.

To the Editor of Photographic Notes.

SIR,—May I beg the favour of a few lines in your next No. in answer to a letter which appeared in the *Notes* of March 15.

Mr. Parker, your correspondent, commences his letter by alluding to a Paper read by me before the Birmingham Photographic Society a few weeks ago. He then proceeds to enter his protest against some remarks offered therein, on taking pictures and portraits by artificial light. "Mr. Haines," says he, "while commending those who labour in the paths of discovery, professes himself blind to the ultimate good of such an object as this, urging however in the following paragraph that it would be very desirable for moonlight, or evening scenes, and for the astronomer would be of the greatest use."

I must really request Mr. Parker to re-read the remarks in question, and I am sure he will soon discover his error. He will find that I do not, in the latter paragraph, allude at all to *artificial*

light, but to *moonlight*. I will, however, with your permission, quote a few lines of my Paper upon this subject.

I say, "There is a great talk of taking pictures by artificial light. This may be very well in theory, but will not, in my opinion, do in practice. I commend all who try to make discoveries of any description in the art, but I cannot see what is to be the ultimate good of such an object as this."

Here comes a full stop; and in the next line I proceed: "For evening scenes, *moonlight* may be desirable, if practicable, or for the astronomer IT" (the *moonlight*, not *artificial light* as Mr. Parker seems to suppose) "would not only be desirable, but of the greatest use."

After this explanation (which I think would not have been needed if Mr. Parker had read the remarks *rather more attentively*) I hope your correspondent, and your *other readers*, may *understand* and not think I intend to *gild refined gold*, or to *illuminate the moon*.

With regard to Mr. Moule's productions, mentioned by Mr. Parker, I have not yet seen any of them, but I shall take an early opportunity of doing so.

In conclusion, I can only say that I have had but little practice in *Photography by artificial light*, and that what little I have had has been entirely unsuccessful; all the portraits however taken by its means, that I have seen, have been so unearthly and death-like, that they have never impressed themselves upon my mind as good portraits.

Artificial light may be, and is, I admit, very useful and advantageous for printing; but I still consider that for portraits it will never be entirely successful, both on account of its inconvenience, and also of the intense light which must necessarily be used for the purpose and which will not enable the sitter to keep his eyes in their natural position for the appointed time of exposure.

Photography has, I am painfully aware, as your correspondent states, been *vilely prostituted in the hands of unscientific tyros*; but I cannot conceive why that should be any reason for us to abandon an old, and in my opinion the best, system, for a new one which is more difficult and the manipulation of which *involves care, thought, analysis, and that reflection only native to philosophic and scientific minds*.

Apologizing for thus intruding so much on your space,

I remain, Sir, yours faithfully,

C. L. HAINES.

Birmingham, March 16.

THE SOLAR ECLIPSE OF MARCH 15.

To the Editor of Photographic Notes.

SIR,—I do not know whether you will be overburdened with photographic observations about the late eclipse, if you are, you can throw this aside; in the other case, they may be of some little interest.

When it became evident, from the dingy mass of clouds that kept in unbroken succession drifting from a N. N. Westerly direction, that any attempts to obtain the solar image would be abortive, (though for this purpose, I had a camera affixed to a telescope, and spirit level attached, and had taken several instantaneous images before the eclipse commenced, of a diameter of 2 inches, that showed the remarkable quadruple cluster of spots), I determined on taking collodion positives of our garden, with the miscellaneous objects and instruments as they stood, at stated intervals of a quarter of an hour each between the pictures, in order to discover what diminution of photographic action took place, giving such a time of exposure as might appear desirable; the collodion used was out of one bottle, and the silver and developing bath were the same for every picture.

The results were as follow:—

1st at	11h. 55m. exposed	20 seconds,	(too little)
2nd at	12h. 30m. exposed	1 minute,	(much overdone)
3rd at	12h. 30m. exposed	2 minutes,	(barely done)
4th at	12h. 45m. exposed	2 minutes,	(fully done)
5th at	1h. 0m. exposed	5 minutes,	(under done) (middle of eclipse.)
6th at	1h. 15m. exposed	2 minutes,	(fully done)
7th at	1h. 30m. exposed	1 minute,	(well done)
8th at	1h. 45m. exposed	1 minute,	(well done)
9th at	2h. 0m. exposed	1 minute,	(rather overdone)
10th at	2h. 15m. exposed	1 minute,	(overdone)

On comparing the pictures together, I find the one taken in the middle of the eclipse, No. 5, at five minutes exposure, is darker, or rather less developed than either, with the exception of No. 1, that was taken a quarter of an hour after the commencement, with an exposure of 20 seconds. One might estimate therefore, that the pictures taken under the greatest obscuration, namely, at 1 o'clock, was about 12 times as slow as that at 11h. 55m., or certainly under 15 times as slow. I also took some pictures in the evening, to try and find when an equal exposure of 5 minutes, would produce a similar picture to No. 5, of the middle of the eclipse, and this I found at 6 o'clock, about sunset; the clouds being somewhat broken and some little sky visible, but no strong westerly gleams of sun-light occurred. The picture taken at 6 o'clock, with 5 minutes exposure, equalled in general appearance the one taken under greatest eclipse, both being cloudy. My Aneroid barometer, that had been rising the day before, and in the early part of the morning, I found rose only about ·01 of an inch, during the eclipse.

JAMES T. GODDARD.

Whitton, Hounslow, Middlesex,
March 18th.

To the Editor of Photographic Notes.

DEAR SIR,—Allow me, through the medium of your valuable *Notes*, to thank your correspondents Mr. Beattie and M. Gaillard for the formula for transferring the Collodion film to leather, and for making a *good* Varnish for negatives. I had previously used chloroform for dissolving gum benzoin, but find spirits of wine, as recommended, much better. In transferring the film to leather, I do not find it any advantage to add acid to the spirits of wine, as given in *Humphrey's Journal.*

THOS. GULLIVER.

Fisher Street, Swansea.

ON VARIOUS FORMS OF STEREOSCOPES.

To the Editor of Photographic Notes.

SIR,—In your number for March 1, at page 59, you speak of "Salmon's new stereoscope;" and at page 52, in the previous number, you gave a list of patents for improvements (?) of the stereoscope; besides this, there is no lack of information on the subject scattered up and down the pages of your first two volumes, the perusal of which is quite enough to explain both the theory and practice of stereoscopic work to anyone with a few mathematical ideas in his head. There is, however, one point to which I would call your attention, concerning the stereoscopes as at present made and sold to the public.

One universal rule, on which I believe all are agreed, is that *the distance between the pictures and the lenses of the stereoscope should be the same as the distance between the pictures and the lens in the camera.* These pictures are generally produced in the camera by lenses of about 4½ or 5 inches focus, and in the old lenticular form of stereoscope, this five inches between lenses and pictures was always attended to. In the modern prismatic stereoscopes the above rule is disregarded, and this distance is made 6 to 6½ inches, the principal focus of the prisms being about 7½ inches: one consequence of this is, that the distance between the two positions of the camera must be unduly increased to obtain a sufficient appearance of relief for the altered angle of vision, and the whole picture is more or less distorted from the truth.

Now, I do hope you will use your influence to prevent this going on any further; the reproach against engravings is, that they often make views look larger and finer than the reality, but this will soon be said of stereoscopic pictures, when we see an ordinary street made to appear a quarter of a mile wide.

These long focus lenses, requiring thinner glass, it is easier to grind them than the short focus ones, and the question is how long a focus *will sell well.* This is now got to about 7½ inches, and the desire for cheapness will soon make it more.

Whether with prisms, whole lenses, or semi-lenses, one general focus should be adhered to for the ordinary size of stereoscope—the old distance of 5 inches from lens to picture was very good in practice, as it suited the cameras in general use, and it is to be regretted that it was departed from?

"SIMONIDES."

London, March 17, 1858.

—See our remarks on this subject in the leader. [ED. P. N.]

REVERSED ACTION OF LIGHT.

To the Editor of Photographic Notes.

SIR,—At the risk of displaying my ignorance of chemistry, I write to ask an explanation of the following phenomenon, which displayed itself in the course of developing a negative with the ordinary pyro-gallic solution, 1½ grains to the oz. I had completed the development proper, and proceeded to strengthen the negative by pouring over it the developing solution, with the addition of 20 drops per ounce of nitrate bath. On repeating the last mentioned process, I was surprised to see the impresion start out as a positive. Some evergreens, which were in the back ground, shewing of a dark brown; the remainder of the picture shaded in various tints of the same colour, and the white of a lady's dress in the foreground, as also the tips of the trees were touched by the same, remaining pure white. On applying hyposulphite of soda the brightest lights dissolved off, so that on backing the glass with *white* there was a perfect representation of the lights and shadows, as in nature; like a sepia drawing of the tint in Turner's "Liber Studiorum."

The cloth with which I wiped out the developing glass was very probably dirty, but I can offer no other probable cause.

AN OLD SUBSCRIBER.

—We cannot offer any satisfactory explanation of this phenomenon. [ED. P. N.]

STEREOSCOPIC LENSES.

To the Editor of Photographic Notes.

SIR,—I am a young amateur in photography. My camera is a double stereoscopic one, fitted with double achromatic lenses, which takes good portraits in ten seconds. Will you kindly say, in your next *Notes*, the proper scientific positions to place the stops (for landscape) with respect to those lenses, whereby I may get the best and sharpest pictures. Should they be placed between the front and back lenses, or in front of the first lens?

"YOUNG PHOTO."

—The proper position of the stop, *theoretically*, is immediately in contact with the front lens, either before or behind;—but in out-of-door operations it is found better to place it *between* the lenses, in order that it may prevent reflected light from the inside of the tube from falling upon the picture. An improper optical position of the stop has therefore to be adopted, in order to remedy an evil produced by the improper mode of mounting the lenses. Messrs. Voightlander appear to be the only opticians who are awake to the practical inconveniences attending the use of tubes simply blackened on the inside, and they very properly provide the insides of the tubes of their Portrait and Orthoscopic Lenses with a series of small diaphrams. Opticians generally spend so much time behind the counter, and in the workshop, and so little in trying their apparatus experimentally in the field,—they are also so ready to "pooh, pooh" all innovations which give them extra trouble, or interfere with the apparent neatness of their apparatus,—that nothing but strong pressure from without will bring about a better mode of mounting lenses. Many thousands of what would have been fine photographs are ruined annually by the reflected light from the inside of the tubes in which lenses are mounted. [ED. P. N.]

To the Editor of Photographic Notes.

DEAR SIR,—Can you, or any of your Correspondents, favour me, in your next number, with the receipt for making the turpentine or camphine preparation which is poured over the plate to make the powder-colour adhere to collodion pictures when they require colouring? I purchased a bottle some months ago from M. Mansion, of London, for which he charged 10s 6d.!! and I feel assured the actual cost cannot be more than 1s. 6d. for it was either camphine, or, turpentine, with some other ingredient, which caused the colour to adhere. It was poured on and off like collodion, and in ten minutes was ready for colouring.

Ordinary turpentine leaves the plate too *tacky*, and the colour cannot be blended or softened off, and dries with a gloss, like varnish, which ought not to be.

"PHOTOS."

—Can any of our correspondents reply to this query? [ED. P. N.]

"*J. J.*" Your camera should be a little longer than the principal focus (or burning focus) of the lens; the other dimensions are determined by that of the slide. [ED. P. N.]

"*Photo*" complains that on adding lemon juice to a nitrate bath, it turned it slightly blue. He had most probably cut the lemon with a steel knife. [ED. P. N.]

"*R. Dart.*" You may push the development for half-an-hour. Do not stop it too soon. [ED. P. N.]

"*L. H.*" Let the precipitate settle, and decant the clear liquid. Then wash the precipitate thoroughly and dissolve it in nitric acid. Evaporate the solution to dryness. [ED. P. N.]

"*A Jersey Amateur.*" Apply to Mr. Moule; he will give you full information. See his advertisement. [ED. P. N.]

"*An Amateur.*" Our Treatise on the Positive Collodion Process contains full information on the subject of making collodion. [ED. P. N.]

"*A Constant Reader.*" Mr. Mercer's New Calotype Process was not reported in the last number of the Quarterly Journal of the Chemical Society as we hoped it would be. An abstract of Mr. Gaudin's paper on Collodion Positives will appear in our next. [ED. P. N.]

"*Count Wengierski*" enquires how to obtain metallic lead in a state of fine division, to be added to the nitrate bath, in M. Gaudin's process, described in *Notes*, No. 43. The following is the plan that is recommended:—

Add to common litharge (oxide of lead), a dilute solution of nitric acid, and expose to a gentle heat, the litharge being in excess. In this way nitrate of lead is produced and held in solution. Filter the solution, and immerse in it a piece of clean metallic zinc. Lead will then be precipitated in a fine grey powder. [ED. P. N.]

"*R. Linsley*" enquires how to make positive collodion more sensitive, for taking children, &c. The best plan we know of is to reduce the quantity of nitric acid in the bath and developer. This will increase the sensitiveness of the process, but the whites of the picture will become browner by the change in the formula. The most sensitive collodion that can be made by any known formula is that which we have described in our Treatise, and which is simply iodized with iodide of ammonium. [ED. P. N.]

"*Enquirer.*" To obtain really good enlarged positives is a matter of some difficulty. Our advice on this point is hardly worth giving, as we cannot speak from our own experience; nor do we believe that anything really good has been done in this direction. Enlarged portraits have certainly been taken, but only as a guide to the artist, who paints over the photograph. [ED. P. N.]

"*An Observer.*" Mr. East's Camera Chora is a different thing from Mr. Archer's Camera. See Photographic Journal, vol. iii, page 9. [ED. P. N.]

"*J. W.*" Place the stop between the lenses, and nearer to the front lens. [ED. P. N.]

"*Tyro.*" The albumenised paper contained either too much salt or alkali; that is why the albumen was not coagulated, and the white precipitate formed in the bath. [ED. P. N.]

Received "THE PHOTOGRAPHER," M.S. Journal.

☞ *The communications of "Enquirer;" "A Constant Reader;" "R. F. Barnes;" "Outlook;" and the Replies to "An Enquirer;" "T. B. P.;" "L. M.;" "D. H.;" "T Symonds;" "J. Barr;" "Phos.;" "Delta;" "An Observer;" "A. R.;" "Enquirer;" "Ignoramus and Subscriber;" will be given in our next.*

Photographic Notes.

APRIL 15, 1858.

At page 97, of the present number, will be found a letter from Professor Petzval, on the subject of his new view-lens. In this letter M. Petzval denies that the formula of the lens was known to M. Voigtlander seventeen years ago, and states that the memorial addressed by that gentleman to the Academy of Sciences, at Vienna, has not received attention. It appears to us in the highest degree improbable that the formula of a lens, so good as this new instrument of M. Petzval's certainly is, should have been known to any first-rate practical optician for seventeen years without his having availed himself of that knowledge. We are quite willing to believe, on the authority of the man of science who is admitted to have invented it, that this instrument is essentially a new one; and the supposition that it could have been known to M. Voigtlander, but kept back for a number years, is scarcely credible. Photographers are indebted to Professor Petzval for the portrait lens with which they now commonly work, and which, originally manufactured by Messrs. Voigtlander, has been copied by all the leading opticians in France and England; they are now also indebted to him for an improved form of view-lens which is so much superior to that in common use that the latter will no doubt soon be superseded by it.

But although we speak of this instrument as new, we must remind our readers that it is now exactly a year since we first called attention to it. In the leader of No. 25 of this Journal, for April 15th, 1857, is the following paragraph :—"M. Petzval, whose formulæ for portrait lenses have been adopted by Voigtlander and other celebrated makers, has lately introduced a new form of lens, by which he obtains a flatter field, with a wider included angle. The lenses of the combination are brought nearer together than formerly, and their curves modified. The exact particulars however have not been published. *Opticians should lose no time in applying to the proper source for information on this point.*" But no English optician took the hint. It was not until the matter had been brought before the Photographic Society, in December last, by Herr Pretsch (nine months after our first notice of it), that any optician in this country thought it worth his while to trouble his head about it. Nor was the introduction of the matter by Herr Pretsch particularly felicitous. However, photographers are more concerned now with understanding the merits of the lens, and the principle on which it acts, than with the history of its invention, or the mode of its introduction to their notice,—and we have endeavoured, in a somewhat lengthy article in the present number, to explain its exact construction and the principle on which its good qualities depend. This article is the result of a good deal of careful study, and the geometry of it will, we hope, be found intelligible to all.

On first hearing of what appeared to be the singular construction of this new lens, we were sceptical as to its merits, but our doubts are now removed. We have satisfied ourselves, both theoretically and practically, that the theory of it is sound and good; so good in fact, that we advise our readers to have nothing more to say to the old form of view lens.

We have now some remarks to offer on the subject of M. Niepce de St. Victor's recent experiments. We have repeated some of the most important of them, and our results have, in every instance, been similar to those described by him. But we see nothing in any of these experiments to lead us to believe in any "new action of light." Our impressions, as we stated in the last number, are that instead of bottled sunshine in the sealed tube there is simply bottled hydrogen gas; and that an insolated paper, instead of absorbing light and radiating it again in the dark, is simply deprived of some of its oxygen by the well-known *chemical* action of light, and becomes in its turn a de-oxydizing body, capable either of decomposing aqueous vapour and liberating hydrogen, or of reducing a sensitive salt of silver placed in contact with it. In support of this view we have now a remarkable experiment to describe. A jar was filled with pure hydrogen gas, and (in the dark room) a piece of sensitive chloride paper laid across its open end. In a very few minutes the paper was darkened to a brown tint. Next, an engraving, on tolerably thick paper, was laid with its back across the mouth of the jar, and a sensitive chloride paper placed in contact with it; in a few minutes the gas penetrated through the whites of the engraving, and darkened the paper behind, while the blacks of the engraving prevented the gas from passing through, and thus preserved the whites. In this way a well-defined negative image of the engraving was produced by the action of the hydrogen in the jar.

With respect to the action of light on paper prepared with nitrate of uranium, it is sufficient to say that the paper exhibits, after insolation, a faint image of the negative superposed, when viewed by transmitted light, to upset at once the conclusion of M. Niepce that in that case, at any rate, a "new action of light" is concerned. The production of a *visible* image by exposure to light, is surely nothing but common photography.

In the first paper of M. N. de St. Victor's, (*Notes*, No. 41, p. 460), cotton, dyed with various substances, was experimented on. Some of these dyes were favourable to the production of an image by insolation and subsequent contact with sensitive paper; others were not. Among the *insensitive* dyes are mentioned madder, alumina, cochineal, alum, and indigo;—among the sensitive dyes, Prussian blue, and a per-salt of iron. Now, none of the former substances have, to our knowledge, been proved to be de-oxydized by light, and in that state to be capable of absorbing oxygen again; but many of the per-salts of iron *do* possess that property. So far therefore those experiments are favourable to the idea of a chemical change produced by insolation.

Again, in certain experiments, a sheet of glass, or rock crystal, or mica, placed between the insolated engraving and the sensitive paper, was found to prevent the formation of an image. This is intelligible enough if we suppose the image to be produced by hydrogen, or by contact with a de-oxydized substance, but it is difficult to understand how colourless glass can prevent the passage of the chemical rays through it. M. Niepce has himself thrown some doubt upon his first experiments with sulphate of quinine, in which an opposite result is said to have been obtained.

The experiments of M. Niepce are curious and important, from their appearing to indicate the fact that white paper, marble, chalk, &c., are sensitive to light. The chemistry of lignine is still very obscure. There is a per-oxide of lignine; may there not be a lower oxide of it which parts with oxygen when exposed to light, and recovers it in the dark, either from the air, or by decomposing the aqueous vapour which the air always contains? The chemistry of the bleaching process by chlorine is but imperfectly understood. What then may be the effect of bleaching upon lignine? Paper also contains size, and is sometimes dyed with artificial ultra-marine. May it not therefore contain some substance capable of being de-oxydized by light? The chief value of the experiments of M. Niepce appears to us to consist in the new class of substances which he has shown to be chemically affected by light.

The printing processes with a per-salt of uranium, reduced by light, and the image developed with a gold or silver salt, are not new, having been published a year ago in this Journal; and since the principle is identical with that of the old CHRYSOTYPE process of Sir John Herschel, we are much amused at the extravagant enthusiasm with which the Editors of certain contemporary Photographic Journals, both French and English, have announced the supposed wonderful new discoveries in printing by M. Niepce de St. Victor. We are glad, however, to find public attention directed to any form of the CHRYSOTYPE process, for wherever gold is concerned in the production of a print, experience has sufficiently proved that increased permanence is the result.

The theory of the Auro-Uranium process (as it may be called) is simply this:—A paper impregnated with a per-salt of uranium, (the nitrate of the sesqui-oxide for instance), is exposed to light under a negative. Wherever light acts the salt is reduced to a proto-salt (which is a de-oxydizing agent), and a visible but faint image is produced. On immersing the paper in a solution of chloride of gold, an atom of water is decomposed by the proto-salt of uranium, which takes the oxygen and becomes converted again into a per-salt, while the hydrogen combines with the chlorine of the chloride of gold and gold is precipitated in a state of fine division, which presents a blueish tint. The picture is therefore blue and cold in colour, and not very pleasing. It is then immersed in boiling water, which dissolves out the uranium and gold salts. In this state the print is supposed by M. Niepce to be fixed, and its permanence established because boiling cyanide of potassium does not affect it.

The only difference between the above process and the CHRYSOTYPE of Sir John Herschel consists in the employment of a salt of the sesqui-oxide of uranium instead of one of the sesqui-oxide of iron, (the ammonia-citrate of iron). Sir John Herschel did not consider a Chrysotype print to be perfectly fixed by mere washing in water. He fixed it with iodide of potassium. "Nothing," he says, "can surpass the sharpness and perfection of detail of the resulting photograph."

Another uranium process of M. Niepce is to develop with nitrate of silver instead of chloride of gold. In this case metallic silver is reduced by the de-oxydized uranium salt, and the print is of a deep brown tint, and will also resist the action of boiling cyanide

of potassium. This latter process was described a year ago in this Journal as well as the former, and it is precisely analogous to the modified form of Chrysotype in which Sir John Herschel substituted nitrate of silver for chloride of gold.—(Hunt, p. 164).

With respect to the probable permanence of a Chrysotype, or Auro-Uranium print. We have said that the image is formed by metallic gold in a state of fine division, and therefore presenting a blue tint; but there is a prot-oxide of gold of a purple tint, and this oxide might combine with lignine and give a picture having the same appearance as the other. If however the material of the picture were prot-oxide of gold, it would be acted on by hydro-chloric acid, and converted into metallic gold and per-chloride of gold; and this effect *must* occur by developing with *acid* chloride of gold. The picture is therefore, no doubt, metallic gold, and the dark parts are permanent; but unless the whole of the chloride of gold is removed from the paper by some more energetic mode of fixing than mere washing with water, we think it not unlikely that the lights might turn pink in the course of time by exposure to light. Chloride of gold, in the presence of organic matter, is sensitive to light; still it is very soluble in water, and unless the lignine holds a definite quantity in chemical combination with it, which it probably may do, the print may be considered permanently fixed.

But these Auro-Uranium prints are not the only ones which resist the action of boiling cyanide of potassium. Prints on ammonia-nitrate paper, toned with sel-d'or and hydro-chloric acid to a maximum purple tint, will also resist boiling cyanide of potassium; and so will developed prints on serum, toned to the same deep blue tint with sel-d'or. In both these processes, which were published by us in the year '55, the image is principally metallic gold, the same as in the prints of M. Niepce, or Sir John Herschel. The purple tint of a print fully toned with gold, is however inky, and is objectionable in an artistic point of view; and the silver prints *slightly* toned with gold have certainly the best effect. It is important however to be able to produce a blue permanent print if we choose. In the sel-d'or processes the use of hypo-sulphite of soda is objectionable because metallic gold is not capable of resisting the continued action of an alkaline sulphide, but combines with it to form a double sulphide of gold and the alkali. This is no doubt the reason why prints, toned with gold, and not properly washed, have been known to change, and the blue tint of the gold to become red. It is possible also that in the fading of silver prints, the black sulphide of silver may combine with an alkaline sulphide in the paper, and form a yellow double sulphide of silver and the alkali. It is quite certain that washing in an alkali, after fixing with hypo, rather *assists* than *prevents* fading; while prints that have been immersed in weak hydro-chloric acid after fixing in hypo have, according to our experience, a considerable degree of permanence. The great merit of the Auro-Uranium process is, that no fixing or toning-bath is required.

The experiments of M. de la Blanchere with this process will no doubt interest our readers. The proportions he recommends are,—

Nitrate of uranium	96 grains.
Distilled water	1 ounce.

The paper to be either floated or immersed. Expose to sunshine, at this season, from two to ten minutes, and develop immediately with

Acid chloride of gold	2 grains.
Distilled water	1 ounce.

The print is very quickly developed to a deep blue tint. Fix with boiling water.

Or, expose only half as long as before, and develop with

Nitrate of silver (slightly acid)	30 grains.
Distilled water	1 ounce.

The print is quickly developed to a brown tint. Fix as before with boiling water.

Another method is, to expose three times as long as in the first case; to immerse the print in a nearly saturated solution of bi-chloride of mercury until bleached; to wash it thoroughly; and develop with nitrate of silver as before. The tint is a sort of greyish black.

Nitrate of uranium is an acid salt, and coagulates albumen. A piece of paper simply albumenized, and when dry floated upon the uranium bath, may therefore be used for printing upon. In this way very fine definition may be obtained. Gelatine may also be employed in the same way.

Nitrate of uranium is soluble both in ether and alcohol, and may therefore be added to collodion. Plates coated with this collodion, and allowed to dry, may be used for printing transparencies.

We have found the nitrate of uranium more sensitive and better than the tartrate of uranium. A sun-print may be obtained by floating a uranium paper on nitrate of silver, and letting it dry. The paper is not very sensitive, but the print may be fixed with hot water. The nitrate bath is not discoloured by this process, and the yellow tint of the paper is removed by the nitrate of silver. The print may be intensified with gallic acid, or toned with sel-d'or.

Uranium is not a costly metal. It is obtained from a mineral termed Pechblende, and from varieties of uranitic mica found at Callington, in Cornwall. Bucholz observed, some years ago, that an ethereal solution of nitrate of uranium was affected by light. This salt is yellow, and its crystals resemble those of hypo-sulphite of soda. Sesqui-oxide of uranium is a yellow powder.

We strongly recommend the Auro-Uranium process to the notice of those professionals who take portraits on paper to be coloured by the artist. But the new method of printing in carbon has for us at present much greater interest than this resuscitation of the old Chrysotype process, or in fact than any purely chemical process, from the infinite variety and perfect control of tints which is likely to be obtained by it. We sent two or three of Mr. Pouncy's carbon prints to Mr. Hardwich a few days ago, and in reply he says: "I view the carbon prints with the greatest interest, and when I have time shall certainly try the action of various chemicals upon them, and let you know the result."

We mentioned in the last Number that Messrs Davanne & Girard had been engaged in a series of experiments relating to the Chemistry of Positive Printing. In their first published communication relative to these experiments they state that the following results have been obtained:—

Sun-prints on chloride paper without size are grey and leaden, and without vigour; but organic matter added as size to the paper alters the colour of the print to a reddish-brown or orange-red, and renders it more vigorous. The quality of the size has less effect than its quantity. If a chloride paper without size be printed and fixed with hypo-sulphite of soda the image is metallic silver, (as stated in our article on the Chemistry of Printing in No. 47, in which it was shown that the sub-chloride of silver produced by light is first decomposed by hypo-sulphite of soda into chloride of silver and metallic silver, and the chloride of silver then dissolved out); but if organic matter be present it combines chemically with the reduced oxide of silver, and forms a red compound. The qualitative analysis of this substance gave the following results:—

Heated on platinum foil, it burned with the peculiar odour of organic matter and left metallic silver.

Heated with caustic potass, it disengaged ammonia.

Calcined with oxide of copper it set free carbonic acid and water.

It dissolved readily in nitric acid, with disengagement of nitrous fumes, but was insoluble in hydro-chloric acid.

These results are in complete accordance with the views brought forward in our article in No. 47, and also with those which Mr. Hardwich has at different times endeavoured to establish.

As soon as the remainder of this communication is published we shall give the whole of it verbatim, with notes of our own.

A correspondent to whom we are frequently indebted for valuable hints, says in his last letter,—"Now is the time, as there is a new Chancellor of the Exchequer, for yourself and all publishers of Scientific Journals, to urge the desirableness of passing an Act for all works like the *Notes* to carry a fractional stamp, (half-a-farthing or so), to render them post free." We cannot do better than give publicity to so excellent a suggestion. We hope to see one or two good things done by the present Ministry, in matters affecting literature.

A letter from Mr. Wilson, of Aberdeen, on the development of negatives with iron, will appear in our next.

M. PETZVAL'S NEW LENS.

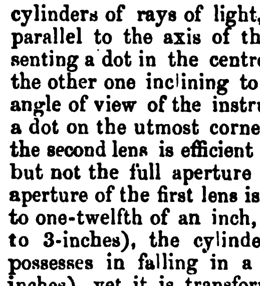
Letter from M. Petzval to M. Paul Pretsch; translated by the latter:—

Several articles in English journals have shown me that some people there are favouring the results of my researches with their attention. But there is also M. Voigtlander, who states having known my new lens for many years, and somebody else, who declares having obtained full particulars from myself. Although I have published a detailed treatise about these matters (a correct translation of which into English I should like very much to see published), it seems, nevertheless, that the real qualities of this new production are not sufficiently known. I take therefore the liberty of making some observations for this purpose, and should be much obliged to you if you would make them known in some Journal connected with this subject.

One of these observations relates to the smaller aperture of the second lens of my objective, the real cause of which I think is not well perceived. Every combination of lenses, invented for any purpose, suffers, as a matter of course, some imperfection, known by the name of aberrations. It is not possible to remove all, because there are many of them. We must be therefore satisfied to remove the most troublesome, and to compensate or balance the remaining ones amongst themselves. These remaining ones consolidate the natural ability, the special character of the instrument, limit the aperture and the degree of sharpness, cause sometimes the use of a diaphragm, to which they give a certain place. In the combination for views, this place for the stop is near the place of the second

lens, therefore the mountings of this lens can be used as a diaphragm. For the same reason the place of a diaphragm in a portrait combination is in the centre of the tube, between the two lenses. These circumstances regulate the proportions of aperture, and if, in a combination for portraits, both achromatic lenses can possess the same aperture, it is still necessary to diminish, in a combination for views, the aperture of the second lens. But, if we are not afraid of a little sacrifice in glass, which is connected with a repeated enlarging of the front lens, this diminution serves also for another purpose, viz., perfect equality of light in the centre, as well as in the extremest corners and edges of the picture, a peculiarity which will be appreciated in future more and more.

To make this more clear, we may imagine two cylinders of rays of light, the first one falling in parallel to the axis of the instrument, and representing a dot in the centre of the field of view;—the other one inclining to the axis under the half angle of view of the instrument, and representing a dot on the utmost corner. The full aperture of the second lens is efficient for both cones of rays, but not the full aperture of the first one. If the aperture of the first lens is 36 lines (one line equal to one-twelfth of an inch, therefore 36 lines equal to 3-inches), the cylinder of the central rays possesses in falling in a diameter of 36 lines (3 inches), yet it is transformed after the refraction by this lens into a cone of rays which has at the place where it reaches the second lens, only a diameter of 32 lines ($2\frac{2}{3}$-ins.) of the section. However, this quantity of light will not be admitted through the second lens, because this lens has not 32 lines, but only 24 lines (2-inches) aperture. Therefore the edges of 4 lines ($\frac{1}{3}$ of an inch), round the first lens, are not efficient or active, and form the sacrifice which has been made to the equal distribution of light. Consequently the objective acts like a combination of lenses with an aperture of 28 lines ($2\frac{1}{3}$-ins.), which is now equally available for all the bundles of rays, with the only difference that the aperture with the centre O acts for the central bundle, but the aperture with the centre P for the utmost edges of the picture, the last one touching the edges of the lens. All these are fixed proportions, which are founded in the nature of the matter; they are therefore not at all arbitrary, and I can only add that such a lens *must* possess the aptitude of producing by the given proportions of aperture without any diaphragm the sharpest picture of an object suitably placed.



I have found in some papers the opinion expressed that this new lens is especially constructed for taking views, and not at all available for taking portraits. I am convinced by the profundity of the theory, that it is not so. With some sacrifices in optic means, namely, by adding two lenses more, we can obtain such an important advantage in light, that this will become really practicable. Moreover, I think that we might, under favourable circumstances, for the sake of the extraordinary beauty of the pictures, and of their plastic appearance, prefer the use of the view combination for taking portraits, because the time of exposure is not much more than double the amount.

M. Voigtlander asserts in his letter about these matters that this new lens has been known to him for 17 years, and has made this assertion also to the Imperial Academy of Sciences in Vienna—that amongst the unsuccessful trials made at that time for the purpose of carrying out some of my calculations, had been a similar lens;—I had been, as usual, not satisfied with his productions,—and some little things, for instance the proportions of aperture, differences of about 3-inches in the diameter of curvatures, which reach the absolute value of one-sixth, were no matter of importance, if only the principle be the same. He considers therefore the matter as an old acquaintance, and gives it the name of "Orthoscopic objective."

I wish to reply hereto briefly. There is only one principle in all optics, and this is the law of sines of the refractions; all combinations of lenses, whatever they may be, must be constructed according to this law. Therefore in this respect M. Voigtlander is right, if he means that this new lens is constructed according to this old and well-known principle. He possesses also the merit of having been the first who executed, 17 years ago, the well known portrait lens, calculated by myself, but known by the name of Voigtlander's. After I had broken off every connexion with him, and not communicated to him any theory, or formulæ, or tables, he was obliged to go his own way, and has in fact invented the chemical focus. I am unable to appreciate this new invention of M. Voigtlander's. I consider it rather a great "misère" of photography; he has therefore all the merits of this invention for himself, and has in fact (the short period of 17 years excepted), never, and in no way worked according to my calculation, does not work even now according to them, which is proved sufficiently by his chemical focus, boasting in his price list under my name. If the calculation of the new lens was communicated to M. Voigtlander seventeen years ago, there arises reasonably enough the question, "why has he kept from the photographic world during seventeen years this valuable production, the want of which has been felt long ago?" But perhaps he might have wanted seventeen years for inventing the very nice name "Orthoscopic objective," which invention would not have been due to myself.

M. Voigtlander says also that the camera with the movement on a prism, and the surface of the image inclining to the axis of the instrument, is a very ingenious arrangement, but not necessary at all, since everything can be obtained with an ordinary camera. But I myself have found this camera indispensable for the view-lens, because the nature of the lens requires the inclination of the surface of the image to the axis of the instrument. And there arises the question again, how it happened that M. Voigtlander could have known this lens during seventeen years, remaining in perfect darkness about its peculiarities. No doubt he might be very glad to put his name beside my own; this is quite

natural, and somebody else thinks the same, but the mode and manner in which this has been carried out is more than ingenious.

At all events I am obliged to assert that at present nobody works according to my calculations, except the optician M. Dietzler, in Vienna. *

M. Voigtlander's memorial to the Academy of Vienna has been rejected as an absurdity.

Please to translate these my observations into English, and make them known in some of the photographic journals.

JOSEPH PETZVAL.

Vienna, March 20, 1858.

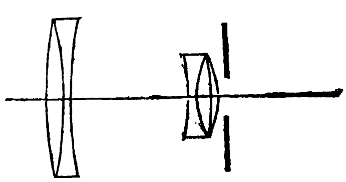
* Whose sole Agent in England is Mr. PAUL PRETSCH, 67, Great Portland Street, London, W.

ANALYSIS OF THE ORTHOSCOPIC LENS.

We shall endeavour in the present article to discuss fully the geometry of the new lens lately introduced by Messrs. Voigtlander and Son, and called by them the "Orthoscopic Lens;" observing that it is constructed on the same principle as a new lens manufactured by M. Dietzler of Vienna, according to the formula and under the superintendence of M. Petzval, an eminent German Mathematician, who is the inventor of this form of instrument, as well as of the Portrait Lens in common use.

The term "Orthoscopic," adopted by Messrs. Voigtlander, is derived from the two Greek words "orthos," right, and "skopeo," I see; and the idea intended to be conveyed by the term as applied to a photographic lens, is, that it gives a picture much more free from distortion than other photographic lenses. We shall shew bye-and-bye that the term is not misapplied to it.

The Orthoscopic Lens is an arrangement consisting of two achromatic compound lenses separated by an interval, as shown in the figure.



The front lens is the larger, and is the same as the front lens of the present combination for portraits; that is to say it is composed of a double convex lens of crown glass, cemented with Canada balsam to a concave lens of flint, the entire lens having *negative* focal length—that is, causing parallel rays to converge to a focus on the *opposite* side of the lens to the origin of light.

The posterior lens is an achromatic compound lens formed of two, not cemented together but merely touching at the edges, and having a space between them in the middle, as shewn in the figure. The inner lens is of flint glass, and double concave, the flatter side being outwards. The outer lens is a meniscus of crown glass, having its convex side outwards and next to the picture. The deepest concavity of the flint lens is therefore opposite to the concavity of the meniscus. As these lenses are not cemented together but have a cavity between them, their inner surfaces may sometimes require wiping: they are therefore merely deposited in the cell which receives them, and are fixed in their place by an open cap, which is screwed until it touches a brass ring laid in contact with the outer lens. When a stop is used it is placed between the ring and the cap, as shewn in the figure. The diameter of the posterior lens is about two-thirds that of the front lens, and the distance between them is about half the diameter of the front lens.

The posterior compound lens has *positive* focal length, and would cause parallel rays to *diverge* from a point on the *same* side of the lens as the origin of light. The front lens therefore tends to bring parallel rays to a focus, the back lens to scatter them wider apart. In popular language the front lens is convex and magnifies, the back lens is concave and diminishes.*

The exact particulars of the compound lenses are as follow:—

Front lens—Diameter....	8 centimètres.		
Focal length.	40	do.	(Negative)
Back lens—Diameter....	5 centimètres.		
Focal length.	90	do.	(Positive)
Distance between the lenses	4 centimètres.		
Focal length of entire combination.........	63	do.	(Negative)
Diameter of the field.....	54	do.	

[A centimètre is about two-fifths of an inch.]

These dimensions apply to the 3-inch lens, but by dividing or multiplying them all by any given quantity, the corresponding dimensions of any other size of lens may be obtained.

The front lens is placed with its convex side to the view, and the back lens with its

* We would take this opportunity of observing that in optics the signs *plus* and *minus* are introduced into formulæ from their property of being able to represent not merely the operations of addition and subtraction, but also contrariety of position or direction. By calling lines measured on one side of a lens positive, and on the other side negative, and affixing the signs *plus* or *minus* to the magnitude of a line, according to its position, it is possible to make one formula include a great variety of different cases. The convention adopted in optics is, to call lines measured from the lens *towards* the origin of light *positive*, and in the opposite direction negative. In other branches of mathematics it is found very convenient to adopt similar conventions in which the signs *plus* and *minus* indicate *opposite qualities*, as well as mere addition and subtraction.

convex side to the picture. The optical principle, therefore, enunciated by M. Derffel at a recent meeting of the Photographic Society, and said to be the discovery of M. Petzval, has not been observed in the construction of this instrument; nor has that principle, so far as we know, been demonstrated in any work on Optics.

Since the front lens of this new instrument is the same in every respect as the front lens of Voigtlander's Portrait Combination, the latter may be converted into the former by removing its posterior lens, and substituting for it the posterior lens of the Orthoscopic Combination, mounted of course at its proper distance from the front lens.

In order to cut off reflected light from the inside of the tube, a stop is placed midway between the front and back lens; but not so as to intercept any of the legitimate rays of light.

Such is the construction of the Orthoscopic Lens. It is essentially a VIEW-LENS, and is not intended for portraiture. We have therefore to discuss its merits as a view-lens when compared with the ordinary form, and in doing so must direct our attention more particularly to the following points :—

1st,—Flatness of Field, and the included angle of view.

2nd,—Freedom from Distortion.

3rd,—Equality of illumination.

4th,—Perfection of focus, and freedom from spherical aberration.

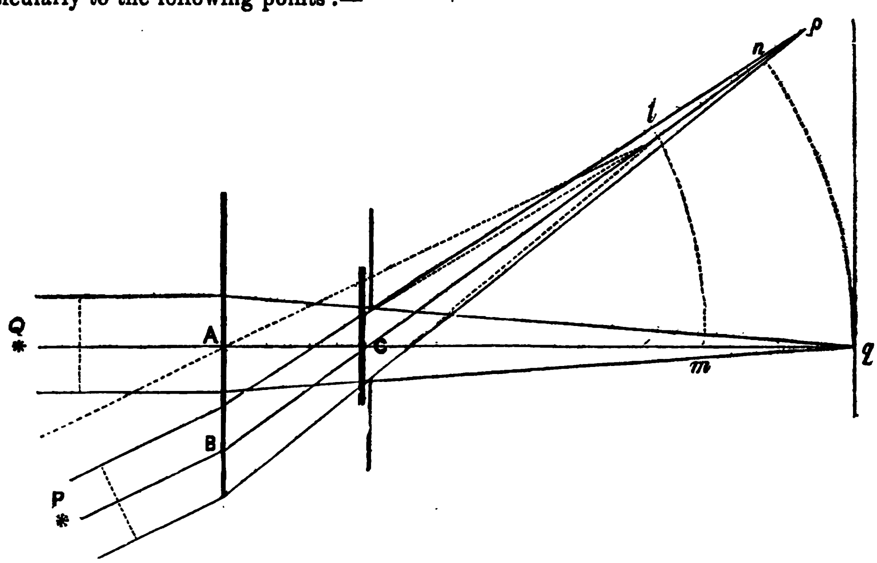
5th,—Coincidence of the visual and actinic foci.

6th,—General convenience, freedom from diffused light, copying powers when the focus is elongated, power of rendering aerial perspective, and other good qualities.

We shall discuss these matters in the order in which they stand.

1st,—Flatness of Field, and the included angle of view.

In determining the flatness of field of any lens, we have to compare the course of the most oblique with that of a direct pencil; and the simplest plan is to suppose the pencils cylindrical, or that the lens is pointed at extremely distant objects; should it be found to answer well in this case it will be equally good for all ordinary purposes.



In the above figure the lenses are represented by straight lines, strong and black, the front lens passing through A and the back lens through C; A C q being their common axis. A stop is placed behind the back lens, and in contact with it. In order to fix the ideas, and render what we have to say more intelligible, we shall suppose the lens to be a No. 1, having a combined focus of rather more than 11-inches, and covering a picture 10 × 8, with a half-inch stop.

It will be seen, from the above figure, that the oblique pencil passes *ex*centrically through the front lens and *cen*trically through the back lens. If, then, q be the focus of the direct pencil from a distant point Q, and p the focus of an oblique pencil from a distant point P, we have to compare the length C p with C q, in order to discover the flatness of field, and how far it deviates from a sphere whose centre is C; and we would observe that unless it *does* deviate, and that pretty

considerably, from such a sphere, the lens would be next to worthless for the purpose intended. We have to show, then, that the focal length, C p, of the oblique pencil, is greater than the focal length, C q, of the direct pencil, and to calculate the difference between them.

Let us consider first the case of the direct pencil incident at A. After refraction through the front lens it converges towards m, the principal focus of that lens; the distance A m being 8-inches (in round numbers). This converging pencil is then refracted by the posterior lens, the positive focal length of which is 18-inches (in round numbers). The effect of this is to diminish the convergency of the rays and bring them to a focus at q, which is further than m from C. The distance A C being one inch, C m is 7-inches, and C q is then found in the following way :—

Multiply 7×18, and divide the product by their difference ;—that is, divide 126 by 11. This gives C q $=$ $11\frac{5}{11}$-inches.

Next, let us consider the oblique pencil which proceeds from a distant point P, is incident *ex*centrically on the front lens at B, and passes centrically through the back lens at C.

Through A, the centre of the front lens, draw a dotted line A l, parallel to B P, and with A as centre, and A m as radius, strike an arc of a circle cutting A l at l. Then, A l equals 8-inches ; and the oblique pencil from P will, after passing through the front lens, converge towards the point l (as shown by the dotted lines).

Now we come to the pith of the matter. What happens at the second lens ?

We have at the second lens an oblique pencil, incident centrically, and converging towards l. Join therefore C l, and produce it to p. Also, with C as centre and C q as radius, strike a circle cutting C p at n. C n is therefore equal to C q.

Now, adopting the same formula as in the former case in order to find C p, we must multiply C l by 18 and divide the product by their difference. What then is the length of C l ?

In the reply to this query will be seen the great ingenuity of M. Petzval's arrangement ; for it appears that C l is greater than C m.

The proof of this is easy enough. Any two sides of a triangle are, together, greater than the third, therefore l C and C A are together greater than A l, and therefore than A m. Take away the common part A C, and C l is proved to be greater than C m.

The actual difference between C l and C m in the No. 1 lens, with the extreme oblique pencil, is about the one-tenth of an inch. If then we multiply $7\frac{1}{10} \times 18$ and $\div$ the product by their difference, we get C p $= 11\frac{79}{109}$-ins. The difference between C l and C m, (n p), is therefore nearly one-third of an inch. This is of course in favour of flatness of field, because it brings p nearer to the plane through q.

In the common view-lens, presented to extremely distant objects, the field is very approximately a sphere the centre of which is the centre of the convex surface of the lens. On taking the exact dimensions of the Orthoscopic Lens, and working the problem out completely, we find that, as regards flatness of field, the common view-lens has a little the advantage ; and this result of theory is also borne out by the experiments we have made with both forms of lens differing but little in their focal length. In what follows, however, we shall show that in other respects the Orthoscopic Lens has many and great advantages over the common view-lens.

So much for flatness of field. Next, with respect to the angular extent of the field of view. It might be supposed that the common view-lens having the advantage in *flatness* of field, it ought to include a wider angular field; but that is not the case, because the distortion produced by the common view-lens is so great, and becomes so unbearable when a certain small angle of field is exceeded, that it is necessary from this cause to restrict that angle to about 35°. In the case of the Orthoscopic Lens, the distortion is not only different in *character*, but much less in *amount*, and therefore, although the field is not absolutely so flat, still an angle as great as 47° may be included. This is a great merit of the Orthoscopic Lens, and one which should recommend it particularly to the notice of the landscape photographer ; because the bad effects of curvature of the image may be remedied by using a small stop, but for distortion there is no such remedy. A small stop gives a finer point to the pencils, but does not affect the curvature of the lines of the picture.

We now come to the 2nd topic, viz : Freedom from Distortion.

In the common view-lens with the stop in front, the oblique pencils do not pass straight through the margin of the lens, but are bent out of their course, inwards, towards the centre of the picture. This produces distortion, in a way in which we will endeavour to explain. Suppose the stop extremely small, and the lens removed ; a perspective view would then be formed on the focusing screen, but larger than the picture produced by the lens, and quite free from distortion. Suppose a plain irregular polygon to be the figure represented, the angles of which on the

focusing screen are points A, B, C, D, &c., and let 0 be the point where the axis of the camera cuts it. Draw radial lines 0 A, 0 B, 0 C, 0 D, &c. Now introduce the lens. In consequence of the deflection of the axes of the pencils which pass through the margin of it, towards the point 0, the image of the polygon will be smaller than before, and its angular points a, b, c, d, &c., will lie on the lines 0A, 0B, 0C, &c., nearer to 0. Now, if the decrements a A, b B, c C, &c. were exactly proportional to the radial lines 0 A, 0 B, 0 C, &c., the small polygon a b c d-- would be exactly similar to the large one A B C D--- and there would be no distortion; but no such law is observed in the production of these decrements as that of direct proportionality to the radial line, and the greater the radial line may be, *a fortiori* greater the decrement becomes. This produces distortion, and causes all straight lines which do not pass through the centre of the picture, to be bent inwards at their extremities.

Now let us turn to the Orthoscopic Lens. Here we see that the axes of the oblique pencils are bent *outwards* out of their course, and a *larger* picture produced than if a small hole, without lenses, were put at C. Instead of *de*crements we have now *in*crements of the radial lines—and the production of these increments depends upon a different law from that of the decrements in the former case, and produces less distortion. What little distortion there is has the effect of rendering straight lines *convex* to the centre of the picture, by bending their extremities outwards, but this defect is so inconsiderable as to be scarcely appreciable, and so far as it exists it has the *good* effect of increasing the comparative size of the *side* objects, and therefore throwing the central objects apparently further back; while the common view-lens has the opposite effect to such an extent as to interfere greatly with the aerial perspective, by diminishing the objects at the sides of the picture, which are generally the nearest, and thereby bringing the central and generally most distant objects apparently too much forward.

3rd,—Equality of Illumination. Through m imagine a line m k drawn at right angles to m C, and cutting C p in k. Now let a straight line passing always through this imaginary point k sweep round the circumference of the stop at C and mark out with its end a circle on the front lens, in the neighbourhood of B, which would be its centre. Similarly, let a line passing through m sweep round the circumference of the stop and trace another circle on the front lens, the centre of which would be A. These two circles, viz., that at A and that at B will be equal to another. But if instead of the point k we take the point l, nearer to C, the circle at B will then become *larger* than before and consequently larger than that at A. Hence it follows that the area on the front lens covered by an oblique pencil is *greater* than that covered by the direct pencil. On the other hand the obliquity of the pencil occasions loss of light, as shewn by the dotted lines across it. The gain from one cause does not entirely compensate for the loss from the other, and there is not *perfect* equality of illumination; but in the common view-lens there is loss from obliquity of incidence without *any* set off to counterbalance it. The Orthoscopic Lens has therefore the advantage as regards equality of illumination.

4th,—Perfection of focus, and freedom from spherical aberration. In the common view-lens *no* attempt is made to cure spherical aberration, or improve the focus, except by means of the stop. Everything is sacrificed to flatness of field. There would be *much* less spherical aberration in the central pencil if the lens could be turned with its convex side to the view. But in the Orthoscopic Combination spherical aberration may be, and is, *completely* remedied, and the quality of the focus, both of the direct and oblique pencils, greatly improved.

5th,—Coincidence of the visual and actinic foci. With four glasses instead of two, more lines of the spectrum may be united, and therefore the chemical focus improved. So that the Orthoscopic Lens has the advantage in that respect.

6th,—In lightness and convenience, and freedom from diffused light, the Orthoscopic Lens has greatly the advantage over the other. In copying, the common view-lens cannot be used when the copy is to exceed one half the size of the original; but when the focus of the Orthoscopic Lens is lengthened by bringing the object near it, it gives a sharp and good image up to full size. It is in fact the best copying lens that has yet been produced.

On the whole therefore, although we do not by any means go the length of the French Committee appointed to try and report on this instrument, in asserting its good qualities, we are inclined strongly to advise our readers to procure a lens on this principle;—and to render the matter complete we should say, add to it one of M. Petzval's cameras, in which the plate may be inclined at any angle to the axis of the camera. We shall take an early opportunity of describing this piece of apparatus.

In a letter just received from Mr. Knight, alluding to the negatives we sent him, taken with the Orthoscopic Lens No. 1, on 10 × 8 plates, with a half-inch stop, he says, "I have

printed some copies from your negatives and they are beautifully sharp." It requires, as Herr Pretsch says, a photographer to take a picture, but it also requires a *good lens* to take it "beautifully sharp." [ED. P. N.]

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ON THE DRY COLLODION PROCESS.

To the Editor of Photographic Notes.

SIR,—It appears by your report of the January Meeting of the Birmingham Photographic Society, [*Notes*, No. 45,] that, during the discussion which followed the reading of Mr. Morris's Paper, exception was taken to the Preface of the Second Edition of my work on the "Dry Collodion Process," the remarks therein contained respecting Dr. Hill Norris's discoveries being characterized by Mr. Osborn as unwarranted and uncalled for. It appears also that on a previous occasion that gentleman introduced the subject to the Society, and treated it in a somewhat similar manner.

Will you allow me, through the medium of your Journal, to reply to these observations, and to give my version of the matter?

My first successful negatives, (Rotherithe Church, and Somerset House, enclosed herewith), were photographed and exhibited in October, 1854. They were taken by the method described in the First Edition of "Dry Collodion Process," May, 1856. That pamphlet would have been published in July, 1855, (the rough notes being quite ready), had not ill-health compelled me to abandon all photographic or active pursuits.

In that edition will be found the following remarks:—

"I find the Collodion is greatly improved after the lapse of eight or ten weeks. Especial care should be taken to reserve a small quantity of old collodion to add to the freshly iodized. If the collodion is required to be used in a day or two after it has been iodized, the addition of the old collodion should be made in the proportion, &c."

An appendix appeared in December, 1856, containing slight modifications of the process, and in which I pointed out, more strongly, the advantages to be derived from the use of albumen, a substratum of which was already recommended in the first edition, pages 25, and following. The second, and last edition, came out in August last.

Dr. Hill Norris's first letter, dated April 1855, appeared in the "Journal of the Photographic Society," of that month. He simply directs the plates to be sensitized in the usual manner, immersed in distilled water, and dried; those intended for the production of negatives, being finally washed over with a solution of pyro-gallic acid.

His next communication, dated May, 1856, (inserted in the July No. of the "Journal of the Photographic Society"), contains the following paragraphs:—

"After numerous experiments, many of which were directed towards re-softening the film by substances having a partially solvent action upon it, I have arrived at this conclusion, that in order to prepare a collodion plate in such a condition that after desiccation it can be restored to a penetrable pappy state, it is necessary to float over it, while still wet, some substance soluble in water, or at least penetrable by water, so that its capillaries or pores, being filled with this substance, the gallic acid and silver solution used in developing, may readily penetrate to the particles of iodide of silver, acted upon by light." * * *

"As regards the collodion, it does not seem to matter whether it is new or old, as the object is merely to produce a beautifully even layer of iodide of silver, with a collodion giving a pappy soft film, easily receiving the impression of the finger, in contra-distinction to one of a very firm, contractile nature: the after-development is far more rapid, being completed in from ten minutes to a quarter of an hour, instead of, as with the latter collodion, an hour or two."

In the third letter, (*Phot. Notes*, Sept. 1856), we find nothing novel respecting the collodion, it being merely stated that "all good collodions, either positive or negative, will be suitable for my process; but some require a longer time than others in the gelatine bath."

In the fourth communication, however, (Dec. 1856), Dr. Hill Norris seems to have become suddenly aware of the absolute necessity of using an old collodion in the preparation of dry plates, for he then says:—

"I find that almost any manufacture of collodion is suitable for dry purposes, providing it has acquired age. In nearly a hundred specimens of collodion, prepared for experiment, I was unsuccessful so long as they were new, but they gradually improved by keeping, till most became workable."

Upon comparing dates and quotations, the only conclusion I was able to arrive at, was, that up to —indeed, until some time after—the publication of my pamphlet, Dr. Hill Norris was working absolutely in the dark, and that it was only after its issue, that the facts above referred to, were discovered by that gentleman. You will therefore readily imagine, that it was with considerable astonishment I found this so called discovery, paraded in Mr. Hardwich's "Manual of Photographic Chemistry," and you will perhaps allow, that I was quite justified in making the comments complained of, a copy of which I beg to enclose.

Apologizing for taking up so much of your valuable space. I remain,

Your obedient Servant,

64a, New Bond Street. R. F. BARNES.

"*Ignoramus*" and "*A Subscriber.*" Instead of a cone in front of the lens, it is better to continue the camera about a foot, or more, and have a round hole in front of it, with a door to open and shut. The dimensions of the parts of this arrrangement may be easily determined by trial. When a cone is used the slant slides reflect light.

Nitrate of baryta for the positive developer may be dissolved in hot water, but it should not be added to the other ingredients until it is absolutely cold. Always focus for the eyes of the sitter.

[ED. P. N.]

"*T. Symonds.*" Dark lines on the plate are frequently owing to its not being properly rubbed dry, and polished, before pouring on the collodion. [ED. P. N.]

"*D. H.*" Want of density in negatives is frequently owing to the nitrate bath containing too much free nitric acid. Neutralize with carbonate of soda, (not ammonia), and then acidify with acetic acid. Acetate of soda, added to the bath, increases the density of the negative, by forming acetate of silver, which is dissolved in small quantity, and being an *organic* compound of the metal, *reddens* the image in the early stage of the development, and causes it to acquire more precipitate from the decomposing pyro-gallo-nitrate. It diminishes the sensitiveness of the film.

Another cause of want of density is, want of free nitrate on the plate, or in the developer. Pyro-gallo-nitrate is the developer, (or intensifier), not pyro-gallic acid.

Iodide of potassium in the collodion appears to give the densest and best negatives, and the most sensitive film. [ED. P. N.]

"*L. M.*" Try Mr. Keith's collodion. We do not, however, think that iodide of cadmium in positive collodion would produce the "scaly effect" you describe, on pouring on the developer. We cannot give you sound advice without actually seeing a faulty specimen.

The front lens of your combination should be mounted with its flat side to the view, if you wish to use it as a view-lens, and there should be a small stop in front. A view-lens, 10-ins. principal focus, would cover a half-plate sharp to the edges. [ED. P. N.]

"*An Enquirer*" asks for our opinion with respect to developing collodion positives in a bath. We do not think the plan a good one, because the strength and composition of a bath is altered by every plate that is put into it, and this interferes with uniformity of the result. A bath has also the disadvantage of removing from the plate much of the free nitrate which is necessary to the development.

A developer, containing the mixed proto-sulphate and proto-nitrate of iron, with free nitric acid, is very easily decomposed by the introduction of free nitrate of silver; much more so than a developer which merely contains proto-sulphate of iron and acetic acid. The former developer, which is by far the best, must not therefore, on any account, be used as a bath. We consider this developer to be the best, because, in the Positive process the object is to obtain a pure white metallic precipitate, uncontaminated with organic matter. It is probably the acetic acid in the latter form of developer, which, by producing a dark organic sub-salt of silver in the image, injures the tone of the whites. Organic matter should be excluded as much as possible in the Positive process. Nitric acid is the proper acid to employ in the developer, not acetic; and the alcohol in Positive collodion should be scrupulously free from impurities, which are less injurious in Negative collodion.

We cannot perceive any advantage in adding nitrate of silver to the cyanide of potassium used for fixing. [ED. P. N.]

"*Enquirer.*" Our "Treatise on the Negative Collodion Process" will not be ready for some time.

"*T. B. P.*" The glass house should have opaque walls both in front and behind, and also immediately on each side of the sitter, and an opaque roof immediately above and for some little distance in front of him The rest of the side walls and roof should be glass, but not going nearer to the ground than three or four feet. The glazed part should then have thick curtains *everywhere*, which may be drawn as occasion requires. The sitter should face the east, north-east, or north. White reflecting screens should be used, and the floor of the room should be covered with light oilcloth, *near* the sitter, dark drugget at the end opposite to him. The room should be papered with a dark blue paper, particularly at the end opposite to the sitter. The eye must never stare at the light, but rest on some dark object in shadow. The portrait room should be as long as possible, and no more of the sides and roof should be glazed than is really necessary. The end of this long room, opposite to the sitter, will then be dark; and the camera will be in the dark, and there will be room for using a large lens of long focus for groups, &c. On the question of a very *pale*-tinted glass we cannot offer an opinion. *Dark* blue glass is certainly quite wrong. [ED. P. N.]

"*Phos.*" We advise you to have nothing to say to printing enlarged positives, unless they are to be retouched. The plan does not answer for pure photographs. Copy your negatives on a *smaller* scale, as transparencies, and view the prints through a lens; or take your pictures in pairs for the stereoscope, or tele-stereoscope. A great deal may be made of good half-plate negatives in this way, but certainly not by printing enlarged positives on paper. The common view-lens will do for reducing to one half the scale. [ED. P. N.]

"*A Subscriber.*" Use a weaker developer with with less acid, and pour it quickly over the plate. Stains sometimes occur through using a too strong developer containing too much acid. Never use an organic acid, such as acetic, either in the bath or developer for collodion positives. Organic matter should be scrupulously excluded in the Positive process as it combines with the silver, and gives a brown tint to the whites. Nitric is the proper acid for positives. This principle cannot be too strongly enforced. [ED. P. N.]

"*A. R.*" There is at present no law affecting artistic copyright in photographs. [ED. P. N.]

"*L. H.*" Gum benzoin. That of Siam is the best. We shall give several formulæ for spirit varnishes in an early number. [ED. P. N.]

"*A lame dog.*" Try the Paper Negative Process described in No. 12, on Hollingworth's THIN paper, and develop the picture by making it into a tray and spreading the gallic acid with a glass rod. [ED. P. N.]

"*R. T.*" Paper negatives will not do for portraits. Try collodion. [ED. P. N.]

"*Ignoramus.*" A drop or two of water added to the ou ce of collodion will no doubt remedy the greasiness of the film, and render it more easy to transfer it to the leather.

The best remedies for fog are,—a clean plate, an acid nitrate bath, a freshly mixed developer, and to avoid diffused light both in the camera and dark room. [ED. P. N.]

"*Delta.*" The use of nitric acid in preference to acetic in the Positive Collodion Process is certainly correct in principle. The object of that process is to obtain a *white metallic precipitate*, as free as possible from contamination with organic matter. The collodion for positives should therefore be free from impurities in the ether and alcohol, and an organic acid, such as the acetic, should on no account be used, either in the bath or developer. It is the presence of organic maater which gives the brown tint to bad collodion positives. In the Negative process the case is quite different, because the thin grey metallic precipitate of a positive cannot be sufficiently intensified. If the thousands of "shilling men" who now use acetic acid would but consider these remarks, and use the formula recommended in our Treatise, and which is employed by Mr. Keith and other first-rate professionals, their pictures would be greatly improved in tone. [Ed. P. N.]

"*J. Barr.*" If a nitrate bath completely saturated with iodide of silver is thought to work badly from that cause, the only plan is to add water, and throw down some of the iodide of silver, and then to filter and add nitrate of silver in quantity corresponding to the water added. [Ed. P. N.]

"*J. L.*" The processes of M. Beauregard are rather to be considered chemical curiosities than of any practical use. Tincture of Tournesol is tincture of sun-flower. The ferro-cyanide and ferrid-cyanide of potassium are not the same thing. The former is *yellow* prussiate of potass, the latter *red* prussiate of potass. Some fine specimens of these salts may be seen at the South Kensington Museum, among the chemical products obtained from animal matters. Ferri-cyanide and ferrid-cyanide *are* the same thing.

Collodion positives are not permanent unless varnished. The pyroxyline film appears to undergo decomposition, and give off an oxide of nitrogen which destroys the picture. The same remark applies to negatives. [Ed. P. N.]

"*A Constant Reader.*" It is not a bad plan to build the glass room of glass everywhere, except where you *know* glass will not be wanted, and then to employ cu tains to cut off light, as circumstances may suggest. There are times when a photographer wants all the light he can get. [Ed. P. N.]

☞ *The Postcript to Mr. Barnes's letter, and the communications of Mr. Gutch, will be inserted in our next; also the Replies to "Outlook" and "Enquirer."*

Photographic Notes.

MAY 1, 1858.

THERE is an article in the last number of the Art Journal in which a tremendous howl is set up at the expense of the Photographic Society. According to the writer of that article, no improvement that has been made in Photography during the last four or five years can be traced in any way to the Photographic Society; the Exhibition of the Society, now open at the South Kensington Museum, contains no novelties, and indicates no progress, and the Society has itself degenerated into a trading body. The article is not particularly well written, and the writer is in many places illogical in his reasoning and wrong in his facts. We suspect him to be in league with a class of artists whom Photography has robbed of their occupation, and who are now, both in French and English Art Journals, beginning loudly to decry it. We are not particularly sorry to see this, because there is not a surer sign that Photography is advancing in public estimation than to find a certain class of artists attempting to run it down. But we are not going to take up the cudgels in defence of the Photographic Society against such attacks as this; we would simply suggest that an opportunity now offers for the Society to come forward and act liberally in a very important matter. Everyone knows that the fading of positive prints produced by the common method is the great stigma under which Photography lies; and that it is of the utmost importance to discover some process of obtaining positives in carbon, or some permanent pigment or dye. Now, a process of printing in carbon, which yields beautifully clean prints, and appears to do tolerable justice to the negative, has been discovered within the last few months by Mr. John Pouncy, of Dorchester. That gentleman attended the last meeting of the Photographic Society and exhibited some of his carbon prints; but he stated that he considered his discovery a valuable one, and was not in a position to publish his process without some pecuniary compensation. Now therefore is the time for the Photographic Society to act, if they wish to show their zeal in the cause of Photography. They have a balance of some hundreds in their banker's hands. The one-tenth part of that sum would perhaps purchase Mr. Pouncy's secret. Let them purchase it then, and give it freely to the world. Processes of printing photographs in carbon are not offered for sale every day; and in France the Duc de Luynes has offered a prize of 10,000 francs for the best carbon process.

But perhaps the Society may argue that they are a *scientific* body, and have nothing to do with purchasing secret processes, and so forth. We cannot tell what course the Council of the Society may think right to adopt in this matter, but in the event of their *not* acting as we have suggested, we submit the following plan for the consideration of our readers:—We will ourselves open a subscription list, and head it with a guinea. Fifty subscribers of the same amount will, perhaps, be enough; and if we succeed in raising the required sum, and purchasing the process of Mr. Pouncy, it shall be immediately published in this Journal. The list is therefore open. Will any of our readers assist us in this matter?

In the year 1838, before the names of Talbot and Daguerre were heard of as the discoverers of Photography, Mr. Mungo Ponton had produced, by means of bi-chromate of potass, the first fixed photograph. To Scotland therefore belongs the honour of the discovery of Photography. Mr. Ponton's process, published in the Edinburgh New Philosophical Journal, consisted in immersing a piece of well-sized paper in bi-chromate of potass, drying it, and exposing it to light under an engraving. In this way a negative was produced, and the picture was fixed by simply washing it in water. Mr. Ponton observed that by mixing sulphate of indigo (Saxony blue), with the bi-chromate, a pleasing picture was produced, the colour of the object and the ground being different shades of green.

Before long photographers may perhaps be returning to the bi-chromate and Saxony blue, and adding some such ingredient as alizarin or carminic acid, so as to produce a pleasing shade of purple brown, instead of one of green.

In 1840, M. E. Becquerel mixed starch with the bi-chromate, and submitted the picture, after fixing it, to the tincture of iodine. In this way, violet pictures, of no great permanency, were obtained.

Perhaps we may some day have to add that in 1858, Mr. John Pouncy, of Dorchester, added carbon to the bi-chromate, and in this way solved the important problem of printing in carbon. We have not his word for it, but the careful examination of his prints confirms us in this opinion. In the various attempts we have made to perfect a process of this

kind we have partially succeeded, but these partial successes have convinced us that the process is not without its difficulties, and they have led us to appreciate more highly the entire success that has been achieved by Mr. Pouncy. The publication of his process will certainly be the commencement of a new era in Photography, and the principles of dyeing and calico-printing may, ere long, become an important part of the chemistry of that science.

The "Athenæum," in the number for April 17th, p. 500, states that M. Persoz, Professor of Chemistry at the Conservatoire des Arts et Métiers at Paris, is employing the photographic properties of bi-chromate of potass in the printing of silks, &c.; and that the process is exciting much attention. We mentioned this circumstance exactly a year ago, in the number of this Journal for April 15th, 1857. See p. 136, first paragraph.

M. de la Blanchere has published the following method of Printing by Development, without a toning bath, and without any hypo-sulphite of soda; the colour of the prints being absolute black, like that of an engraving. The particulars are as follow :—

Float the paper (Positive Papier Saxe), on a bath of bin-oxalate of ammonia of sufficient strength to give an even coating. Hang it up to dry. Float it on a bath of nitrate of silver, and dry in the dark. Expose for some minutes under a negative. The image is scarcely visible. Develop it with gallic acid, to which a few drops of nitrate of silver may be added if necessary. The print thus obtained is absolutely black, like an engraving. Wash it in water, and fix it by first washing it in a bath either of oxalate of potass, or water slightly acidulated with oxalic acid; and then with ammonia.

We have received from America some numbers of a "Photographic and Fine Art Journal," published by Mr. H. Snelling, of New York. It is published monthly, price five dollars (£1.) per annum, and contains two photographic prints, 10 by 8. The prints have so much artistic merit, and are so much to our taste, that we give the formula by which Mr. Snelling says they were printed. There is not the slightest tinge of yellowness about them; they are on plain paper and are not mounted, the margin of the print being white, and a mount therefore unnecessary.

"The salting solution is,—

Filtered water	1 gallon.
Gelatine	180 grains.
Chloride of ammonium ...	180 „

"The gelatine is first dissolved in hot water, just sufficient to effect the solution, and then the balance of the water added, and chloride of ammonium put in. The whole well shaken.

NITRATE SOLUTION.

Nitrate of silver	1 ounce.
Filtered water...	1 fluid lb.

"Four ounces of the solution poured off and liquor ammoniæ added till the precipitate is re-dissolved, then pour back the four ounces and add seven drops of nitric acid, and filter. Float the paper.

TONING BATH.

Filtered water	1 gallon.
Hypo-soda	1 pound.
Chloride of gold	180 grains.
Chloride of silver	2 ounces.
Chloride of lead solution ...	2 „

"The usual manipulation observed, the solution being filtered every day. In toning, the prints must not be permitted to pass a lilac tint, which is obtained in from fifteen to thirty minutes, according to the strength of printing and the temperature. A cold bath tones much slower than a warm one.

"After toning, the prints are well washed with a sponge on both sides, and put into running water for twenty-four hours; then taken out again, well sponged and dried.

"The title being printed, they are passed through a plate press.

"The paper used is Canson, and like all that he now sends to America, a decidedly miserable article. Out of one ream we lost 180 sheets, caused (to appearance), by some greasy substance in the tissue of the paper. It is also very coarse grained."

A daguerreotype of the recent eclipse of the sun, taken by Mr. Williams, of Regent Street, at Hinton, near Farringdon, was exhibited at the last meeting of the Astronomical Society. About half-an-hour before the greatest obscuration a mock sun appeared on the clouds at some distance from the real luminary. The daguerreotype was taken whilst this remained visible.

A new and perhaps important application of Photography has been suggested by Mr. Robinson Elliot, and has received the name of ELLIOTYPE. A picture is painted on a sheet of glass, in body colour, of variable density. A sheet of sensitive Photographic paper is then laid behind the glass and exposed to light. In this way a photographic copy is obtained, and these may be multiplied indefinitely. An engraving or painting may

be easily copied by laying the sheet of glass upon it, and painting over the outline seen beneath. Artists will no doubt find this a valuable means of reproducing their works without having recourse to the engraver. They have only to paint upon glass, in a suitable medium, instead of upon canvas.

Mr. Lovell Reeve, of Henrietta Street, Covent Garden, is about to publish a Monthly Journal, entitled the Stereoscopic Magazine, price 3s. 6d. He invites the assistance of Photographers, and offers to purchase good Stereoscopic Negatives. We hope this work will be conducted on correct scientific principles.

We have received a second letter from Professor Petzval on the subject of his new lens and camera, but it arrived too late for insertion in the present number, as some diagrams have to be engraved. This letter is an exceedingly interesting as well as amusing communication, and it will appear *in extenso* in our next.

There is an error in our article on the Orthoscopic Lens, in the last number, which we request our readers to correct in the margin, at p. 99, second column. In the posterior compound lens, the concave glass is of crown, and the meniscus of flint, and not as we stated. The error escaped our notice when correcting the proofs. Every optician is no doubt aware that in an achromatic lens of *positive* focus, the conditions are the reverse of those which are observed in a lens of *negative* focal length; that is to say, in the former case, the concave lens is of crown and the convex of flint,—in the latter, the concave lens is of flint, and the convex of crown glass.

At the Meeting of the Royal Society on the 15th ultimo, M. Claudet exhibited a new instrument, to which he has given the name of "STEREOMONOSCOPE." The following remarks from the "Athenæum" of April 24, will explain the object of the instrument:—

"The Stereomonoscope is nothing more than a camera-obscura, before which are placed the two images of a stereoscopic slide, and by means of two object-glasses, sufficiently separated, the two images are refracted on the same space, at the focus of the camera-obscura on the ground glass, where they coincide. By the same laws we have alluded to before, the right picture is seen only by the left eye, and the left picture by the right eye; so that, although only one picture appears represented on the ground glass, each eye sees on the same spot a different picture having its particular perspective, and, consequently, in order to obtain a single vision, the eyes have to converge differently to bring consecutively in the centre of both retinas the different similar points of the two pictures according to their horizontal separation on the ground glass, the criterion of their respective distances. This alteration of the convergence of the optic axis, according to the distance of the various planes, gives the same sensation of relief we obtain when we look at the natural objects, or at their photographic representations. The invention of Mr. Claudet, in our opinion, is called to produce a revolution in the application of the splendid discovery of Prof. Wheatstone to the exhibition of photographic pictures. At all events it is one of the most curious facts connected with modern discoveries in optics,—deserving the attention of philosophers and the admiration of the public. We recommend the lovers of the Arts and Sciences to go and see the Stereomonoscope, which is exhibited in Mr. Claudet's Photographic Establishment, Regent Street."

We shall return to this subject, and discuss it fully in the next number.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, March 26th, 1858.

M. GIRARD read a letter from M. Claudet, in which that gentleman claims, in opposition to M. Hermagis, the priority of the invention which consists in employing whole lenses in the Stereoscope, placed with their centres 2½-ins. apart, instead of semi-lenses or prisms, which displace the images and produce a serious amount of distortion. M. Claudet states that he patented this invention in England on the 8th of March, 1855; that he communicated the particulars in a paper to the Royal Society, an extract from which was published in the Bulletin of the French Society in May, 1856; and that he read a paper and exhibited Stereoscopes on this principle at the Meeting of the British Association at Cheltenham in August, 1856. He affirms that this new form of Lenticular Stereoscope gives images without distortion, and represents objects in their true natural relief; and that it has been offered for sale at his Photographic Establishment in Regent Street, and is usually preferred to the common Stereoscope.

[M. Claudet has certainly established his claim to be considered the inventor of this form of Stereoscope. The complete theory of it will be found discussed by us in *Notes* No. 30. No other Stereoscope should now be made or sold. The semi-lenses and tubes ought to be entirely exploded, and the Treatise of Sir David Brewster laid on the shelf, for it is entirely wrong from beginning to end. But it is not enough to use the Claudet Stereoscope. The pictures must be taken to suit it, in a stereoscopic camera furnished with two lenses, having their axes parallel, and their centres 2½-ins. apart, and the pictures should be mounted according to the directions laid down by us. When

mounted, the distance between the most distant objects in both pictures should not exceed 2½-ins., and for the foreground objects the distance will of course be less. There must also be a partition in the middle of the Stereoscope, and the lenses should have the same focal length as those of the camera. When truth is preferred to boldness of relief, truth may be had by attending strictly to these conditions; but with the common Stereoscope truth is utterly impossible, no matter how the stations are taken, or the pictures mounted.—Ed. P. N.]

M. l'Abbé Moigno (Editor of Cosmos), said he thought the invention had been published in America prior to the date of M. Claudet's patent, and he would look back and ascertain this point.

M. Peligot exhibited a number of positives printed with nitrate of uranium, by the following process :—

Float the paper for a minute or two on a solution of nitrate of uranium, strength 10 per cent.; that is, 48 grains to the ounce of water.

On removing it from the pressure frame, immerse it for five minutes in bi-chloride of mercury, strength about 15 grains to the quart of water. Wash well in water, and then immerse it in a solution of nitrate of silver, strength about 10 grs. to the ounce. Leave it in this solution until entirely developed, and then wash it in several waters. The print is now fixed.

M. Paul Perier exhibited, on behalf of M. Corbin, some proofs on collodionized paper. The process of M. Corbin (see *Notes* No. 36), is said to surpass all the expectations that were at first formed of it. Some recent improvements made by him have not been published, but his prepared papers may be obtained from M. Delahaye, 16, Rue Lancry, Paris.

M. Antonio Cosmes, of Lyons, exhibited some positive prints, some black, others coloured by immersion in a bath. These prints are said to be very fine and remarkable, and are obtained by a new process, very economical and certain, and which gives absolute permanence to the prints.

[M. Cosmes has promised to communicate his process, and our readers shall be informed of it at the earliest opportunity.—Ed. P. N.]

M. Porro stated that he had used a lens on the same principle as the Orthoscopic Lens, for a variety of purposes, since the year 1847. He also gave some particulars of the instrument with which M. Quinet took the recent eclipse of the sun; and exhibited a lens by which portraits could be taken life-size, or drawings copied full size, with a sharpness that left nothing to be desired. This lens is a combination of a large concave and a small convex lens.

M. Ferrier exhibited a complete series of views of the recent eclipse of the sun, taken on small albumenized collodion plates.

M. de la Blanchere exhibited some positives printed with nitrate of uranium. The nitrate of uranium was prepared neutral, strength 10 per cent.; the paper was immersed in this, dried, exposed under the negative, developed with nitrate of silver, and toned with sel-d'or, or chloride of gold.

M. Laulerie (Editor of the Bulletin of the Society), exhibited, on behalf of M. Renaud Saillard, of London, some electrotype plates, obtained from photographs, from which proofs might be struck off in printer's ink.

M. Saillard stated in a note that he had worked for the late Photo-galvanographic Company as electrotypist of their plates. The results were then very uncertain, and required to be retouched by the engraver. Since the break-down of the Company he had endeavoured to improve the process of Herr Pretsch, and could now produce plates which not only require no retouching (as proved by the specimens exhibited), but which might be obtained in a much shorter time, and at less cost. Plates which formerly required six weeks for the deposition of the copper, and cost a good deal for retouching, can now be easily obtained in one week, and require no retouching.

M. Hulot observed that the process was based on the principle published by M. Poitevin, for engraving in relief.

[Now, we hope English Opticians will attend to what we are going to tell them, and not let foreigners continually take the wind out of their sails in matters relating to Photography, and, above all, not be Brewster-ridden in the matter of the Stereoscope. Let them attend to what follows :—]

M. Shiestz exhibited, under the name of "American Stereoscope," a very attractive little piece of furniture. This is a box, or cupboard, containing 24 stereoscopic pictures, arranged about a horizontal axis, and capable of being brought in succession before the lenses, which are mounted in the front of the box. *These are entire lenses, on the Hermagis principle. The complete insulation of the pictures, which fill the field of view, adds greatly to the illusion, and the objects appear of their natural size, and in true relief.* This is a pleasing ornament for the drawing-room.

M. Delahaye exhibited a new form of cuvette in porcelain, deeper than the ordinary dishes, and which had a raised end, so as to prevent the liquid from running over when the dish was tilted.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, March 30th, 1858.

The Vice-President, W. Howell, Esq., in the Chair.

The minutes of the last meeting having been read and confirmed, Mr. Philip Harris was duly elected a member of the Society.

Mr. Osborn then announced that it was in contemplation to form a Photographic Society at Macclesfield, the Secretary of which solicited the assistance and co-operation of their Birmingham brethren.

After some conversation on the subject the Chairman then called upon Mr. W. B. Osborn, the Tieasurer, to read his paper upon "Photography,"

ITS APPLICATION TO THE PRESENT WANTS OF SOCIETY AND ITS FUTURE PROSPECTS.

The beautiful art of Photography is almost universally declared to be at present in its infancy. The term, perhaps, may be considered scarcely applicable to an art, which has been before the public for so many years, but we may liken it with safety, to a youth of bright promise, watched over with anxiety and pleasure by its friends, beautiful and charming even in its present realities, partially revealed though they are, yet foreshadowing a glorious manhood, when bursting from the trammels which at present confines its path and dims its lustre; it shall repay its enthusiastic admirers by a display of power and beauty, of which even the most sanguine scarcely dare to dream. It is not our provinee this evening to trace its early history and search for the slight causes from which this young giant of the age has sprung, that has already been done, over and over again, in the works of such men as Hunt and Hardwich, and in papers read before our own, and other Societies.

Our aim to-night is to consider the present applications of Photography to the Arts and Sciences, and to shadow forth our anticipations for its future, to hint at its probable uses, and to show as nearly as we can, from bygone experiences, and the indications now before us, of what the art may reasonably be supposed to be capable; and should these ideas be thought romantic and extravagant, and not likely to be realized, let me remind you of the past, and of the gigantic strides that have already been made in the art, and of the wonders that have been accomplished, and then ask you,—Who shall dare to place a limit to its progress, or say of what it shall not be capable, or where its onward course shall stop?

Look back for a moment to the time, when the Alchemists, in their ardent search after an impossibility, stumbled over the apparently insignificant fact, that Horn Silver (chloride of silver), darkened by exposure to light. Who would have thought that from such an humble origin, from such a simple fact, thrown aside as worthless, and well nigh forgotten as soon as discovered, the mighty structure we now admire so much, should have arisen? Truly it furnishes us with an apt illustration of the adage,—

"What great events from trifling causes spring."

The germ of this discovery lay hid for many years, but at last, in our own time, it suddenly burst forth into life and light, like a lovely flower,

"A thing of beauty, and of joy for ever."

So much for the past, now let us consider the present and the future.

I shall first endeavour to place before you a rapid summary of the processes now most in use, together with their recent improvements, and then show their adaptation to the present wants of Society, and their probable bearing on the future.

First on my list comes the glorious, although I regret to say, almost obsolete discovery of the great Daguerre; for beauty and delicacy it is unsurpassed, even at the present day, but I am compelled to admit that the objections urged against it are many and weighty, so much so that I fear it must eventually give way to more modern and simpler processes.

Yet can anything be more exquisite than a really first-rate Daguerreotype portrait—more delicate in its detail, or softer, or more beautiful in its gradations of light and shade? For certain purposes to which I shall presently refer it undoubtedly stands unrivalled.

The Calotype, or Talbotype, comes next in order, the result of the experiments and researches of our illustrious countryman, Henry Fox Talbot, to whom, with Daguerre, equal honour is due. Who can contemplate the beautiful pictures of the earlier Calotypists without a feeling somewhat akin to envy at the superiority of their works over some of ours, even with all the increased appliances at our call. Our own town has produced some excellent followers of this branch. I may mention our Vice-Presidents, George Shaw and William Howell—Johnstone, and George Hill, whose works were in our Exhibition. What delicacy and softness and beautiful delineation, do you find in many Calotypes, and there are numbers upon which we can still gaze with feelings of admiration, although years have passed since they were produced.

But times and things change, and other methods have sprung up to supplant the old ones, and there are but few who practice the Calotypy now. The Wax-Paper has found many votaries, and is in some respects superior to the Calotype; some splendid things have been produced by this process, and in skilful hands may rival glass. Albumen on glass has also had its day, its chief drawback being its extreme slowness in receiving impressions in the camera; many practitioners have produced first-rate pictures, worthy of emulation and praise.

But to our lamented countryman, Frederick Scott Archer, is due the crowning triumph of the art. With his grand discovery of the applicability of Collodion as a vehicle for the sensitive film, a new era dawned upon Photography, new powers were given to it, a new field opened to its research, and numberless new applications brought to bear upon it.

The Collodion Process, whether Positive or Negative, is unsurpassed for giving extreme delicacy and softness combined with marvellous rapidity, or sensitiveness, so much so that in the hands of clever manipulators, absolutely instantaneous pictures have been obtained. This process is now almost universally adopted and merits a high degree of praise, and yet with all that is known about the practice of the art, there is a great amount of ignorance upon the subject of Collodion, that is, the Chemistry of it. Light however is dawning upon us, and we may hope that now we have some of the first chemists of the day employed upon it, we shall not long remain deficient of true theoretical knowledge

upon the matter, for until we obtain this, we are only groping in the dark, and occasionally stumbling over facts hitherto concealed. It is a mortifying reflection that we know so little of the nature and properties of light, the subtle agent by which we work, or that we find it so difficult to assign satisfactory reasons for the many perplexing changes, which so often occur in practice, and the curious results we frequently meet with.

The use of collodion in a dry state next claims our attention; this is a discovery of infinite value to all Photographers, and promises to prove of immense utility. The one drawback to its extended use—want of sensitiveness, will no doubt be soon removed, but this is more than compensated by its keeping qualities. I believe, by Dr. Hill Norris's process, plates may be preserved an indefinite time; to this gentleman is due high praise, for his liberality in giving to the Photographic world the result of his arduous researches and experiments; and also for producing a really useable and simple Dry Process.

While we may claim for him the merit of being the *first* discoverer, whilst on this subject we must not forget the claims of Mr. Barnes, as the author of a process, more complicated it is true, but tending to the same end. To both gentlemen we wish every success in their efforts, and trust that they may be able very soon to render Dry Collodion as sensitive as the wet is now.

Collodio-Albumen deservedly holds a high rank as a dry process and in some hands has produced exquisitively beautiful results, but its complication precludes its general use.

With this cursory glance I must now proceed to the consideration of the main subject of the present paper and endeavour to show how far Photography is applicable to the present wants of Society, and what may be the future prospects of the Art. And here a field of speculation is opened to our view, which might occupy several papers like the present without exhausting the subject. In the first place, then, Portraiture will ever claim the services of Photography to a great extent. The facility with which it is accomplished, and the marvellous fidelity of its results when in good hands, will always secure it a place in public estimation; for you must bear in mind that the fault of the hideous caricatures we so often see exhibited under the name of Photographs, lies with the sitter and operator, and not in the Art itself. Due attention to this will always secure remuneration to the clever artist. Who can look without emotion upon the portrait of some dear friend, separated perhaps by hundreds or thousands of miles, or perchance removed by the hand of death, and gaze on each well-remembered feature, so faithfully depicted on the tablet before him by the unerring pencil of light, without blessing the art which can thus immortalize and recall the remembrance of happy days and hours, long since buried in the irrecoverable past. It is needless to dwell upon this theme, as it must find an echo in the hearts of all present, who will endorse the value of Photography for this purpose.

What a noble future opens out for Photography in its application to the purposes of education. Here its utility will be immeasurable, and so obvious that it is really a matter of surprise that the instructors of youth have not availed themselves of its existence, in conjunction with the Stereoscope, to a much greater extent than they have yet done. By its aid we can place before our youth the whole wonders of the animal, vegetable, and mineral kingdoms; all the remarkable places of the earth, unembellished and unexaggerated by the fancy of the painter, but vivid transcripts of the reality. Beginning with the infant schools, we can give correct representations of the objects of common life, in any size, and instead of the impossible animals so depicted in their picture books, we can furnish them with exact copies of the originals. To the youth, and the more advanced student what infinite assistance and interest does Stereoscopic Photography give to their studies. Is he reading History? Photography furnishes him with the identical spots on which mighty events took place, and in which the world's heroes lived. Is Biblical history his study? and the manners and customs of the East? Here, again, Photography is ready to help him. By its aid he can roam thro' Palestine and the Holy Land, visit the scenes where our Saviour performed his wondrous miracles,—the spots rendered sacred by his presence in life, and his sufferings in death. Rome, with her Castle and the Vatican, St. Peter's and the Coliseum, and the hundred recollections of her departed glory. Egypt, with her Pyramids and strange hieroglyphics, and the wonders of her Architecture. Thebes, with her hundred gates and ruined Memnon. Nubia, with her tombs. Assyria, with her wondrous sculptures and buried palaces. All these have been and will be photographed for the benefit of those who stay at home.

Still further in the scale of education. The geologist can obtain faithful records of every peculiarity in the formation of our earth, and of every fossil which marks a distinct era in the history of our world, and shows him the form of the strange and wondrous animals which once inhabited our globe, and roamed through the mighty forests, whose place is now occupied by thriving towns and cities.

The Antiquary, who delights in the glories of the past, and the buried relics of by-gone ages, in old brasses and tombstones, in ancient armour, and antique carving and tracery, and in fact all that bears the stamp of age, will find Photography a faithful helper in the pursuit of his much-loved study.

We have seen, in a recent excellent paper, read before this Society, of what immense utility it will be to the Architect and Builder, and there are many other professions to which the art is highly adapted, and it is a matter of surprise that it is not more extensively used, for instance, the student of Anatomy, the Surgeon, and the Physician, would all find it extremely useful in their studies. The various forms of the skeleton, the numerous peculiarities of disease or mal-formation, might all be studied with almost as much facility by the fireside as in the lecture room.

To the Sculptor and the Painter it will furnish models of the human form divine, for reference, at times when a living subject might not be available; while to the painter of Landscape scenery its assistance is invaluable, the ever-varying effects of light and shade—the little bits of detail and the numberless points which go to make up a picture, may be faithfully rendered for his use and consultation in the studio, like the memoranda of a student. But while no true artist will make up his pictures by sordid copying from a photograph, there is, on the other hand, scarcely an artist in the kingdom who would not derive great benefit from its assistance. This consideration naturally brings me to the subject of Landscape Photography, and I had thought of saying a word or two on the arrangement of pictures, only that this object has

been accomplished so much better by Mr. Mudd, in his able paper, read before the Manchester Society, on the 3rd of February, that I can only advise you to carefully study it. There is certainly very ample room for improvement among amateurs in this respect—there is a want of artistic feeling in their productions, they are so often tame and spiritless, and not only so, but very often the worst possible position is chosen for the view, as though the operator had dropped his apparatus on the first ground he came to. Look at some of the stereoscope slides offered for sale, how very few are really artistic in character, many of them positively vile; surely this should not be, and you may depend upon this, that as the public taste gets more cultivated, *only those pictures which are really and artistically good*, will meet with a ready sale. The Photographer *must* pay more attention to the characteristics of a good picture, and *must* study effect; in a word, he must be an artist in the true sense of the term, as well as a careful manipulator.

Our friend Mr. Rejlander has shown us how Art may be wedded to Nature in Photography, in many of his beautiful pictures; for example, his "Home, Sweet Home;" a picture made up of artistic bits from various localities, and worked up with great taste, into one harmonious whole, presenting, as you all know, a picture, at once true to nature, artistic in execution, and pleasing in effect. I should earnestly recommend all photographers who desire to excel in the art, and to improve their taste, to purchase several first-rate examples of the works of such men as Fenton, Rejlander, Delamotte, and others, and refer to them constantly, as standards of comparison for their own works, so that by aiming high they may eventually improve their taste, and consequently their productions. What one man has accomplished cannot be an impossibility to others. But I must hasten forward.

The next adaptation of Photography, to which I would direct your attention, is its application to the purposes of trade. Manufacturers have too long neglected and overlooked its importance and utility in furnishing them with pattern books. We had in our Exhibition some first-rate specimens of this use of the Art. I refer to the Agricultural Implements of Messrs. Ransome and Sims.

Microscopic Photography has yet to take an important station in the sphere of utility. I mean the impressions of *magnified* microscopic objects, so that we can see the objects, before invisible, save by the aid of the microscope, now fairly and correctly mapped down before us, on a scale large enough for book illustration. This is a part of the subject which has not yet received the attention that it deserves. Closely allied to this in its uses of Photography is Botany. The minute vesicle and cellular structure of Plants will come under the head of Micro-Photography, while the camera and the pressure frame are both useful in copying the peculiarities of each order of plants.

The Astronomer will doubtless find great advantage from the use of Photography; already have we got Photographic maps of the Sun and Moon, together with a number of Cloud pictures, all of which will be very useful even as they are, but when they are rendered more perfect by means of accurate machinery, and extremely sensitive surfaces, we may not only expect to have first-rate copies of every change in those bodies, but the whole planetary system may be nightly mapped for reference, and many phenomena probably explained.

One more instance of the utility of Photography, and then I must leave this interesting part of the subject. With the aid of the Magic Lantern the Lecturer may illustrate his subject with the transparent slides now to be purchased in every shop where Photographs are sold. By a suitable arrangement such as described recently in one of the Journals, these pictures could be exhibited on a screen about 4 feet by 4 without the necessity of putting out the lights in the room, and while upon this subject, I might suggest to those of you who do not possess a Magic Lantern, that the camera itself might be used as one, requiring only a little alteration, which anyone of common ingenuity might add. The diagram I hand round will fully explain my meaning. By the use of the camera in this way many a winters' evening may be amused.

There are many of the professions to which Photography may lend its aid, either now or in the future; for want of space and time, it would not do to enlarge upon them. I would just instance the Army and Navy, the Surveyor, the Engineer and Machinist, the Designer, and many others which will probably suggest themselves to you. Much however, remains to be accomplished before Photography can be considered a perfect art. The first difficulty that presents itself to our notice, is the peculiar and I may call it opposite effect of different colours on the sensitive surface. Many colours, which in nature are lights, such as yellow and red, &c., are, in the photographs, dark; while blue, which may be called a shade in nature, is always a white in the Positive photograph, the rich tints of Autumn, the glowing colour of ripened corn, and the brilliant hues of many birds and flowers, so beautiful to the eye, are in the photograph sombre aud dull, giving a contrary effect to that of nature and spoiling the general character of the picture. Then again the high lights, such as the reflection of water, the glistening of leaves lighted by the sun, the polish of any metal or stone, in fact any surface which strongly reflects light, are at present often brought out with such startling force and abruptness as to be disagreeable and offensive to the eye. The best of our Photographers have remedied this defect to a certain extent, by only taking pictures in a suitable diffused light, and indeed this is the only method we have of artistic working, yet even with this, the defects still exist, and until they are removed, Photography can never take the high place among the Arts to which our wishes aspire.

This, of course, must continue until we arrive at a better knowledge of the action of the actinic force, or rather I might say at what is the real cause or foundation of the molecular changes which take place. Another bar to progress, and a very strong argument in the hands of those who wish to decry our Art, is the want of originality, and the miserable servility of imitation adopted by so many would-be professors of the Art. I often hear people say, "Oh, Photography is all very well in its way, but there is no Art in it; it is all mechanical; you can only copy. If your chemicals work well, you must get a picture, and then what pictures some of them are, when you have got them—nothing but patches of white and black!"

Much of this is unfortunately true, as I remarked before, it is not every man who plants his camera in the neighbourhood of some charming spot, that is an artist; he may be a clever manipulator, but if he lacks the Artist's feeling, he will do no good. Fifty men may go to the same place, and but one bring back a really artistic picture. Why is this?

Because the forty-nine are content to place the camera in the first convenient spot, while the one studies his picture, chooses the most favourable point of sight, weighs carefully the amount of light and shade, calculates the bearing of part upon part, and judiciously arranges and selects his foreground. The true artist aims not at mere picture making. Loving his work he endeavours to render his subject pleasing, he throws his soul into his Art, and whether Painter, Sculptor, or Photographer, true genius will shine forth in the productions.

In the future what great changes may we expect will take place in the practice of Photography, how the materials with which we now work, will probably be superseded by others of a far more sensitive character, and perhaps at the same time more evenly, (if I may so express myself) impressionable to *all* the rays of the spectrum. The recent suggestive experiments of Victor de St. Niepce open up an interesting field for speculation and enquiry into new and unthought-of properties of light. We find that there is latent light as well as latent heat, and the uses to which this property of light may be applied are very numerous. And there are doubtless many other properties of light, which must be studied ere Photography can take its place as a perfect Art.

With regard to our Printing Processes much remains to be done to secure a really permanent method of fixing Photographic impressions. We may probably hope great things from the promised communications on the subject of printing in pure carbon; should this be successfully carried out we shall have quite a new phase in Photography.

Photo-galvanography and Photo-lithography are both important steps in the advancement of the Art and deserve all encouragement, yet they are but the dawn of what may be accomplished, and I think we may hope to see the day when prepared plates, impressed by light in the camera, shall be quickly engraved by chemical or electrical agency, and ready to place in the hands of the printer in a few hours,—nor is this hope devoid of foundation; you have only to look along the surface of a collodion negative, to discover, that it is in fact engraved and consists of raised and depressed portions. I trust that ere long the Copyright Act may be in some measure applicable to Photographs, for there are many who have sacrificed time, labour and expense, in procuring negatives of distant places, only to have them pirated as soon as published, by some unprincipled person.

There are many other interesting speculations into which we might enter, did time allow, but I draw to a conclusion, and I cannot close this paper more fittingly, than with an allusion to the aim and object of all true Photographers, the production of Photographs in the Natural Colour.

Few who have carefully watched the progress of our art will venture to deny the possibility of this illumination. I believe that it will be accomplished. Faint gleams have already shewn themselves, in the experiments of M. Testud de Beauregard and others, and I have in my possession a collodion positive in which one colour is naturally impressed (the blue of a lady's handkerchief) but how I cannot tell. This desideratum accomplished, Photography will step at once into a new existence, and revel in a new world. A wide field is here opened for us; there is ample room for all to exercise their genius. Then let me exhort every true Photographer, to cast aside as puerile, the exhibition of petty jealousies which have of late so much disfigured the pages of our Journals, and each contributing his mite towards the common stock, strive to advance the progress of our delightful art.

Through the kindness of my friend, Dr. Hill Norris, I am enabled to exhibit to you, by means of the Magic Lantern, a series of transparent slides, by the Dry Collodion Process.

Mr. Osborn also exhibited a very light and portable slide, of his own invention, for holding Dry Collodion Plates, which was greatly admired for its simplicity and lightness.

A short discussion followed, in which the Chairman and several members took part, when a vote of thanks was given to Mr. Osborn for his interesting paper, and the Meeting adjourned until April 27th, when the Rev. Wm. Law will read a paper entitled—"A few stray notes from Memoranda of Photographic Difficulties," illustrated by experiments and apparatus.

ON DEVELOPING NEGATIVES WITH IRON.

To the Editor of Photographic Notes.

Sir,—You have on several occasions been good enough to mention with unqualified praise some of my Stereoscopic Views which you had seen, remarking at the same time that you understood them to have been developed with the proto-sulphate of iron, This is not altogether correct however, for I use both pyro-gallic acid and proto-sulphate of iron, according as the circumstances of the case require, indeed I sometimes use both of them in developing the same negative.

Almost all the Scottish photographers that I am acquainted with have used iron as a developer for years, and Mr. Tunny, of Edinburgh, who instructed me in the art five years ago, has used it, if I mistake not, since 1851. I cannot claim any merit therefore on the score of originality; and I suspect it is more in the manner of using it, and being careful in choosing subjects and timing the exposure, than from any superiority that iron has over pyro-gallic acid, that my views are said to be excellent. When my subject is well lighted, I prefer pyro-gallic acid as a developer, but when there is great contrast in the picture, and an undue portion of deep shadow, then iron is much to be preferred.

When proto-sulphate of iron is used, a much shorter exposure in the camera is required, and when uncertain about the proper time I begin to develop with pyro-gallic acid, and if all the details come up I develop in the usual way. If the plate appears to be under-exposed however, I wash off the pyro-gallic acid; when the negative is half developed pour over

it a solution of nitrate of silver, from a little kept in a measure for that purpose, and then dash on the solution of proto-sulphate of iron. This brings up the details at once, and often saves a negative that would have otherwise been useless.

Before taking the camera to a spot, I find it a good plan to make a previous visit on a day when nothing else can be done, and after taking the bearings as it were, and choosing the best point of view, the hour of the day when the subject will be best lighted will be more easily determined. This saves time when you come back to work on a fine day, and often prevents the annoyance of walking to a spot with all your apparatus, in the early morning, and making the discovery that it will not be properly lighted till the afternoon. When I pitch my camp opposite a good subject, perhaps 50 or a 100 miles away from home, I think it foolishness to come away with one or two bad negatives, if, by a little perseverance, or by waiting a day or two even, I can bring home a perfect one. Perseverance, and as you remarked some time ago, " a little artistic knowledge, and a little common sense," are more to be depended upon than peculiarities in the developing solution. These are not to be neglected, but I believe that any little excellence my works may display, is to be attributed more to some artistic knowledge than to any little excellence in the Chemistry of Photography.

I hope, therefore, you will continue to advocate the claims of Photography, as an art, and to uphold its dignity in an artistic point of view, as you have done, almost alone, hitherto.

Your most obedient Servant,

GEO. N. WILSON.

Aberdeen, April 7th, 1858.

"THE PHOTOGRAPHER."

(Manuscript Photographic Journal. No. 1.)

NEW SERIES.

MR. TAYLOR'S PAPER.

"I will tell you how, on a recent occasion, I made the most of a lens. It is a landscape lens, 18-inches focus, but the camera to which it was attached would only expand 11-inches. I got a set of long focus unclipped meniscus spectacle eyes, one of which I inserted under the diaphram. This reduced the focus to the desired length, and the resulting picture was very sharp. I was so pleased that I tried the converse of the experiment, viz., by a con*cave* lens to *lengthen* the focus. In this I was successful. I advise any of you to try this, by all means, as the cost is so small. Unfitted bi-convex spectacle eyes, round, and about 1-inch diameter, only cost 9d. per dozen; meniscus and bi-concave about three times that sum."

Mr. Taylor then describes a pair of lanterns he is having made, for exhibiting dissolving views, transparent photographs, &c. He says,—"The object-glass is an ordinary quarter-size achromatic combination, of a rather short focus. Pictures, when exhibited through such achromatics, are exceedingly sharp compared with the ordinary object-glasses." He uses the lime-ball light and oxy-hydrogen gases, and places a condenser between the light and the picture, the object-glasses being in the focus of the condenser. He proposes also to place a parabolic reflector between the condenser and lime-ball light, and asks if anyone will advise him on this matter. [We consider Mr. Taylor's arrangement quite correct in principle, and the parabolic reflector an improvement. The portrait lens, No. 1, makes an excellent lens for the magic lantern. When the two lenses of a stereoscopic camera are used in dissolving view lanterns, a pair of transparent stereograms may be exhibited on the *opposite* walls of an apartment, and viewed by reflectors. This application of the Stereoscope is very important, and has yet to be worked out. The oxy-calcium light is very good, and the oxygen very easily made. It is less dangerous than the other, and the light very white and brilliant. We exhibited a set of Mr. Frith's views of Egypt, in this way, the other evening, and they were greatly admired, but we had unfortunately only one lantern. Copies of sculpture, on a black background, exhibited in this way, are very fine; and so are portraits, when good.—ED. P. N.]

MR. R L. JONES'S PAPER.

"Two subjects are at present very interesting to Photographers; perhaps the most of any is PERMANENT PRINTING, and a DRY COLLODION PROCESS that shall be in all respects satisfactory.

"With regard to the former. I am disposed to think that the processes of development are the only ones to be relied on with certainty, and at present I am inclined to follow that of Mr. Sutton, last published, where he prepares his paper with salt and lemon-juice only. I find that with slight exposure and long development I get fine blacks, and with longer exposure and cutting the development rather short, I get good browns, which nevertheless appear to have gallic acid enough to render them permanent. I enclose a specimen of the latter, which, to my eye, presents a very pleasing colour, more like a drawing than an engraving, which is what I think we ought to aim at. It is *printed on* 'Papier Saxe.'

"With respect to the latter. Dr. Hill Norris's and Mr. Long's processes seem to do *almost* all that we need; the tenderness of the film is a drawback, but the especial difficulty I find is that of their requiring a neutral exciting bath, and therefore there is a continual liability to get out of order. Now the albumen upon unsensitized collodion, if it could be successfully carried out, would be as simple as the gelatine process, and would enable us to add acetic acid to the exciting solution and to keep it always in order.

"Will some of our contributors turn their attention to this? That is, to Collodion—unexcited if possible—and covered with albumen, or something that will bear an acid bath. I have had some fine negatives on waxed paper, but unless much washed, a single hot day will deteriorate it, and if much washed the exposure must be *very* long. With Long's Dry Collodion I have to give five minutes in the sun at this time of the year."

Mr. G. C. Warren's Paper.

"I am sorry I cannot give Mr. Taylor any advice regarding Parabolic Reflectors for his Dissolving View Lanterns, but I would like him to try an experiment with the Lime Light when his apparatus is complete.

"During last summer I managed to enlarge several small negative portraits to life size, upon Iodized Paper; the exposure varied from five minutes to half-an-hour. This comparatively dull weather prevents my obtaining a good picture in any reasonable time, so I have thought of trying Artificial Light, and think the Lime Light would be the best to adopt. If Mr. Taylor, when his apparatus is in working order, will just pin up a piece of sensitive paper (Calotype) at the focus of his enlarged picture, he may very possibly obtain an impression: if so, the use of the Lime Light in his lantern will be an advance in the Art of Photography.

"Dry Collodion Process.—At present I am much inclined towards a modification of Long's Gelatine Process. When I first tried this method, as published, I could not keep the film on the glass, nor could I prevent my negative developing unevenly (I used pyro-gallic), owing to the innumerable blisters formed. I tried Long's and Hill Norris's Collodion, but both were the same; thinking over the matter, the following ideas struck me:—

"The gelatine in drying will contract, and when again wetted will expand or swell, and at the same time be almost sure to move the collodion with it. You are sure to have innumerable hills and dales. It at once suggested itself to me to dilute the gelatine and introduce some ingredient to prevent its drying so hard and horny, or contracting so much, I introduce either honey or dextrine, or both, about 1 drachm to 20 ounces of gelatine solution. This I find has the desired effect, and the plates can be developed with the pyro-gallic solution without fear of blistering, and, with proper collodion, without coming off the glass. My method is to make the preservative solution according to Long's formulæ, and then add an equal bulk of water, for instance, if I make 10 ozs. of Long's Preservative Solution, I add to it 10 ozs. of distilled water, then add the honey or dextrine.

"Instead of using honey to preserve plates for a short time, I find the ordinary syrup (simple) of the chemists', adding half-a-grain of citric acid and half-an-ounce of water to each ounce of syrup, much better, and more likely to produce a picture free from stains. The enclosed developed print by Mr. Jones is the best specimen of the sort I have met with, still there is the same want that we experience in all developed prints, the want of richness and depth, *combined* with transparency in the dark parts and shadows. I suppose we shall get over it just in time to welcome an entirely new process, such as the Printing Direct in Carbon. I tried, some month or more back to print in a similar way, as Mr. Sutton suggests, with bi-chromate of potass and lampblack. Lampblack is too coarse, even the finest. Indian ink would be better, or perhaps a mixture of transparent water colours, as lake sepia and indigo, but I do not think this way will answer well at all.

"If the Panoramic Lens can be worked well it will be just the thing that is wanted for views. It must have occurred to many besides myself how much better the pictures would look if we could but include a larger angle; it will add greater interest to the picture."

Mr. R. Rimmer's Paper.

"Our friend Mr. Jones, in his remarks on the Dry Collodion Processes complains most justly of the tender films which they but too often produce. I have no doubt that this *may* be avoided by employing a suitable sample of collodion, which it is however almost impossible, with any degree of certainty to procure. I have more than once gone to the fountain head, and employed that prepared (or, at all events *said* to be prepared), by Hill Norris himself, but there was always the same blistering and peeling off of the film. I believe that Mr. Berry, of Liverpool, can supply a sample of pyroxyline, expressly prepared for the Dry Process, with which any amateur may make most excellent collodion. For my own part, however, I much prefer the Honey Process, it steers as it were a middle course; it is neither absolutely wet, nor absolutely dry, and is capable of producing negatives which no other process can easily surpass, while its keeping properties are, for all ordinary purposes quite sufficient. *In medio tutissimus ibis.*

"In the employment of honey moreover, Mr. Jones need not in any way distress himself about his nitrate bath. It is quite true that honied plates, being moist, are not *quite* so easily packed as those perfectly dry, still I would rather endure this than experience the mortification of finding a long day's toil rewarded only with tender and blistered films.

"I enclose a view of the South Porch of Lincoln Cathedral, taken on a honey plate, and am sorry that I have not a better print to vindicate the claims of my favourite process."

Mr. Sutton's Paper.

"I enclose a few little specimens which will no doubt interest you. One is, a print in carbon, by Mr. Pouncy; another a transferred daguerreotype; another, a negative on collodionized paper; another, a positive on the back of an address card; and the last, a positive transferred from glass to leather by damping it with spirits of wine. The great novelty is of course the print in carbon. If you examine it narrowly you will see that the paper was first blackened all over, and the photograph fixed in carbon by means of bi-chromate of potass. Observe how remarkably clean the lights are, although the paper has once been blackened all over; they are in

fact whiter than the paper was originally; and that the paper *was* blackened all over I have no doubt, because Mr. Pouncy has himself told me so, and as for the bi-chromate, you may *see* it, at the bottom of the paper, at the back of the paper, and by transmitted light. I find that if I first gelatinize a piece of paper, and then blacken it with printer's ink, the most adhesive stuff of all, the whole can be removed on the following day by a boiling hot solution of soda, and the paper left rather whiter and cleaner than it was at first. Again, if a piece of paper is rubbed all over with stone blue, dried, and then a solution of bi-chromate applied, dried, and exposed under a negative,—and lastly, soaked in a hot solution of soda, the whites become perfectly clean, and the dark parts are absolutely fixed to the paper. We are assuredly on the eve of an important change in the printing processes, and this will open a new branch of industry to hundreds, and give Photography an immense spur onwards.

"As for the Panoramic Camera, I am quite satisfied it will answer. It is a mere question of £. s. d. to get the mechanism of it perfect.

"I am now unfortunately greatly occupied with a Dictionary of Photography, which will be published next month, or I should have more time to experiment with the carbon printing; but I hope Mr. Pouncy will soon publish the details of his manipulation. I consider that great credit is due to him for what he has done; and I hope he will be adequately rewarded for it."

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

INSTRUMENT FOR TESTING NITRATE OF SILVER BATHS.

To the Editor of Photographic Notes.

SIR,—Is it not to be regretted that we still see so many advertisements respecting Hydrometers "for testing nitrate of silver baths." It must occur to every one, who reflects for a moment on the matter, that this form of instrument is entirely incapable of estimating the amount of silver existing in a bath which has been even a short time in use.

Without taking into account the ever-varying amount of alcohol and ether reducing the specific gravity of the collodion bath, each plate, as it removes its dose of iodide of silver, leaves an equivalent of nitrate of ammonia, potassa, or cadmium, as the case may be, which of course is indicated by the so-called "Argentometer," and produces an error in the calculation in direct proportion to the equivalent number of the base contained. In fact the only use of an hydrometer is to show us what we know quite as well without it, that our bath decreases in strength by being worked.

I have devised a very simple form of apparatus for testing all aqueous solutions of nitrate, or ammonia-nitrate of silver; in which, however, it must be observed, there is no new principle involved; my only claim is to have carried a well known instrument and process to their last degree of simplicity.

A glass tube, 5-inches long, and ½-inch diameter, has welded to one of its extremities another tube not quite ⅜-inch diameter and five in length;—the former has fitted to it a piston, which constitutes it a syringe, the total capacity of which is equal to that of the lower portion; which is graduated into 25 *divisions* each subdivided into five graduations, each 1 minim; the inferior extremity is drawn out to a capillary orifice.

I make the best liquid by dissolving 69 grains pure dry chloride of sodium in 1000 minims, (2 fluid ounces plus 40 minims) of distilled water.

Take any fraction of a fluid ounce of the bath to be tested, mix it with an equal volume of nitric acid and twice or thrice its bulk of pure water, fill the instrument to the top mark, (the zero), with test liquor, and gradually depressing the piston, allow it to run into the bath prepared as above and kept vigorously stirred.

At first the precipitate (chloride of silver) subsides very readily; but, near the point of saturation the supernatant liquid remains much longer milky, and more caution must be exercised. When the addition of one drop no longer occasions a precipitate the operation is complete. The number of graduations left empty indicates the number of grains of nitrate of silver contained in the liquid under examination; a graduation of five minims being one *division* of the instrument, as before observed. J. B. HOCKIN.

—Mr. Hockin does not seem to be aware that the Argentometer advertised by Mr. Wood of Cheapside acts on the same principle as that which he has described. Every Photographer should possess an instrument of this kind, and a quantity of the test solution of PURE chloride of sodium. Common salt will not do, as it contains the chlorides of calcium and magnesium, and the sulphates of lime and magnesia.

Pure chloride of sodium is made by adding pure hydrochloric acid in excess to pure carbonate of soda, and evaporating to dryness.

It is very slightly deliquescent, when pure; the deliquescence of common salt being occasioned by the pressure of chloride of magnesium,

[ED. P. N.]

"*Outlook.*" A landscape lens, 7-inches focus, would cover a plate 6 × 4, if a one-eighth-inch stop were used, but the objects at the corners and sides of the picture would suffer distortion.

Streaks upon the background, above the head, looking as if the reduced silver on the lights of the face had not been fixed to the film, but had run down when the plate was in the camera, are, we think, an indication that the collodion is too horny and impenetrable, and wants a little water, say a drop or two to the ounce. This appearance is very curious, and we have observed it both in positives and negatives. It seems to happen with greasy films which are difficult to wet in the nitrate bath, from the ether and alcohol being too strong.

The same condition of film is liable to produce, with nitric acid in the developer for positives, silvery spangles in the plate; and also dark stains where the developer does not act equally.

Collodion must positively contain a certain quantity of water, or it does not properly hold the

chemicals, or allow the solutions to flow upon it. On the other hand, too much water causes the film to crack in millions of places, particularly in the skies. There is a limit to the amount of water which should not be exceeded, but that limit should be approached as nearly as possible. Collodion made with absolute ether and alcohol, as recommended by some chemists we could name, is an absurdity. [Ed. P. N.]

"*Un bon ami.*" Wear india-rubber finger caps; or, if you dislike cyanide of potassium for cleansing the hands, proceed thus :—

Dissolve 50 grains of chloride of ammonium in an ounce of water, and when dissolved add bi-chloride of mercury to saturation. Use this solution instead of cyanide of potassium. It is equally dangerous as a poison if taken internally, but comparatively harmless when applied externally. Wash the hands well after the application of this detergent. [Ed. P. N.]

"*G. S. E.*" See *Notes*, No. 43; Mr. Beattie's process. [Ed. P. N.]

"*Philo-Photo.*" There is no mistake in our report of the process of M. Frank, of Villecholle, for developing negatives with gallic acid and lead. In our hands it succeeds perfectly. Try again. Perhaps your nitrate bath was alkaline. [Ed. P. N.]

"*H. K.*" In printing by development, by the process described in *Notes*, No. 42, the following points should be observed. The development should begin of a fiery-red tint, and should be pushed to the extreme limit in order to get permanent black tones which will resist the hypo. The hypo bath should not be stronger than one part of hypo to twenty parts of water. These points must be strictly observed, or the finished print will be red and feeble. [Ed. P. N.]

☞ *The Communications of Mr. J. W. G. Gutch, "Chemical," "N." Mr. Barnes; and the Replies to "Enquirer," "Photo," and "An Amateur," Isle of Wight, will be given in our next.*

Photographic Notes.

MAY 15, 1858.

The following communication from Professor Petzval will no doubt be read with great interest:—

PROFESSOR PETZVAL'S NEW LENS,

EXPLAINED BY HIMSELF, IN A LETTER TO MR. PAUL PRETSCH.

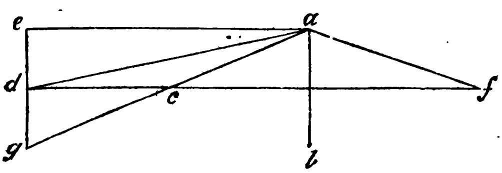
(Translated and finally corrected by Mr. Pretsch).

"After having finished my new lens, I introduced it to the public by placing the same before the Imperial Academy of Sciences in Vienna, and by explaining its qualities and abilities in certain lectures. These lectures have been published in two pamphlets, but, as a matter of course, they are published in German; a few copies of the same I have sent, through Mr. Pretsch, to England, and I hope to see them shortly published in a good English translation. It is therefore not my fault if the English Photographic world is so little informed of the real qualities of this lens. Some views expressed in public papers have induced me to mention this fact again; moreover, there appear to be some competitors trying to make the public believe that their inferior imitations are the only genuine ones. All these matters stimulate me to publish again some observations on this subject in the hope that I may not lose the attention of the public.

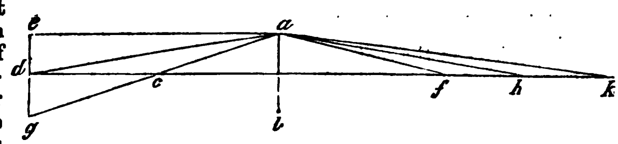
"I consider it very dangerous to the success of any new production, if people expect to find in it certain qualities which it has not, and which it neither can, nor pretends to possess. I will therefore candidly state all the abilities which the public might expect, but which my lens cannot possess, afterwards explaining those which in reality it *does* possess.

"No lens, nor combination of lenses, can be so constructed as to reproduce objects at long and short distances on one and the same plane. This is an absolute impossibility in optics. To suppose such a thing possible is an absurdity, which can be easily exposed in the following manner:—

"Suppose *a b* to be such a lens, and suppose the pencil of rays *c a* to come from *c*,—the pencil *d a* from *d*, and the pencil *e a* from a very long distance. Now some people perhaps would demand that all these pencils of rays should be united in one place or dot *f*. Suppose it could be done, consequently we could imagine *g d e* as one object, and we shall perceive that such a lens (if its production should be possible) would reproduce all the parts of the object *e d g* in *f*, and would therefore give no image at all, but only an illuminated dot in the focus *f*.



"On the contrary, if the pencil *e a*, after its refraction, cuts the axis at *f*, it is an indispensable necessity, that *d a* cuts at *h*, and *c a* at *k*. It can also be added that the difference of the spaces *f* and *k*, is quite independent of the curvatures of the lens, or of the system of lenses, and also of the arrangement of the constituent parts of the lens; but it depends upon the focus of the lens, or of the system of lenses, and the difference of these spaces *f* and *k* increases in the quadrature of its proportion, namely, if the focus becomes double the length, the space *f k* increases to four times its original value.



"It is needless to explain here how it happens that we nevertheless can take equally sharp pictures on one and the same surface, from objects at short and long distances, and even with full aperture, because this has been explained by Mr. Grubb, at page 172 and following, in the Journal of the Photographic Society; and I cannot add anything of importance to these observations, except that he has estimated the difference of distances a little too short, and that he did not consider the circumstance of the real aperture of the lens being not 3-inches, but 2½-inches. He treats therefore the sharpness of the image a little too slightly, which can be proved to anybody by examining the photographic picture by means of a magnifying glass.

"We may here repeat the very simple but important rule to photographers going to take an equally sharp, or perhaps an equally unsharp picture, to rely not only on his lens, but also on his experience, and on the construction of his camera; and especially I consider of great importance the inclination of the surface of the image to the axis of the instrument. In the camera which I have sent you as a specimen, this is provided for by a certain contrivance for the purpose, and it would be very desirable that every photographer should possess knowledge of the simple formulæ in optics for the purpose of finding out easily, without searching a long time, in each case, the required inclination of the surface of the image. I am very sorry to be obliged to confess that unfortunately, and against the taste of Englishmen, this specimen of a camera is made of light-coloured wood, not of poplar, as supposed, but of 'Ahorn,' (maple, false plane-tree).

"The second capability which ought to be discussed, is the mode of obtaining a perfectly flat picture. The construction of such a lens would not only be possible but in fact I myself possess tables for the combination of lenses which are able to produce pictures with less curvature, and also tables for the construction of lenses which are capable of producing perfectly flat pictures. But it appeared to me, that the curvature of a paraboloid of revolution, with about 80-ins. radius of curvature at the vertex, would be just suitable to the greater number of practical purposes. My new lens, with 3-ins. aperture, possesses this peculiarity, and it remains constantly the same, whatever the distance of the object from the lens may be, therefore, also in the case if the object to be taken is situate at a great distance from the lens. Consequently the lens possesses, and ought to possess, the capability of reproducing from a flat picture, an image curved in the mentioned proportion; but it will reproduce from a picture, curved in this proportion, a faultless image of the fifth order.

"I have preferred this curvature of the image instead of a perfect evenness, because it happens very seldom, or not at all, that we can take views of objects placed in a straight line. On the contrary, it happens very frequently that the objects to be taken are placed in a curve whose concavity is directed to the camera.

"In tactics we possess certain rules for the battle-array of the various troops, but not for the purpose of adhering strictly and only to these rules, but for the purpose of giving a general view of the advantages which might be gained by a certain arrangement. Every photographic apparatus possesses also its tactical rules,—namely, the position of the objects to be taken; in fact, such a position as is capable of rendering an equally sharp picture on a flat surface placed vertically to the axis of the instrument. It is advisable to understand this position.

"If the objects in the centre of a picture are to be seen at a very long distance, but if there are at the sides, or in the foreground, objects nearer situated, perhaps at a distance of 80 or 100 steps, we obtain an equally sharp and flat picture.

"The best mode of taking groups of persons is, to place them in the periphery of a circle which is made by the radius of seven feet from any point of the axis of the instrument. The more we deviate from it, the more we shall be troubled by the unsharp parts of the picture, and the more necessary will become an inclination of the surface of the image to the axis of the instrument.

"But I do not intend to say that we can take a picture only in this position;—this rule ought to be applied, for instance, in this way. The photographer going to take a view, tries whether he can find out a spot from which the objects to be taken are seen in the above-mentioned position. Has he found such a spot, then he can take a picture on a surface vertical to the axis of the instrument, and can do it without a diaphragm. If no such spot can be found, then he ought to ascertain whether he can obtain the desired effect by inclining the axis of the instrument, in which case he can obtain by a corresponding movement of the surface of the image, a sharp picture without a diaphragm. The same mode can be applied, if we are going to take objects at near distances, objects which we can place if we choose at the required distance, and mode, from the instrument. But if we are obliged to take objects in unfavourable positions, perhaps in quite a contrary position to that required, near and far objects on the same place, or near to each other, in this case we can only obtain a good picture by using a more or less small diaphragm, and allowing a longer time for exposure.

"I may here as well observe that a camera with a long focus is sensible to unequal distances in the quadrature of the proportion of the foci, namely a lens with 26-inches focus in comparison with such a one of 11-inches, supposing the quantity of light to be the same, will show this difference, in case of an irregular position, five times more.

"The human eye is also a camera-obscura, but a very little one. The limits of its efficiency are from 8-inches to an indefinite distance. A lens of 11-inches focus will reach from 20 steps to the indefinite;—a lens of 26-inches focus from 120 steps to the indefinite;—and if we should construct an instrument of still greater dimensions, perhaps of 52-inches, we should be enabled to take, without a diaphragm, pictures of objects whose distance from the instrument is from 500 steps to the indefinite. These are the troubles in photography which are indispensably connected with the production of large pictures.

"However, I must also state that there might be some cases where lenses reproducing images with other curvatures, or with plane, or even reproducing convex images, might render better service; in fact I myself possess them already. But the present lens possesses a certain curvature;—that is to say, the combination for portraits reproduces a curvature of 15-inches; the combination for views a curvature of 80-inches;—therefore the last one is five times flatter than the first;—and people finding the pictures of the first one tolerably flat, will find also no doubt the last one not too much uneven.

"Having made these observations about the abilities which my lens does not possess, and cannot possess, it may be permitted to me to state also something about the advantages which the same in reality *does* possess, and which are founded on the principles of sound theory.

"1. A PERFECTLY CORRECT PERSPECTIVE, which has already been observed in some of the English papers. Therefore straight lines will remain so, and will not become curved. It has been stated that Voigtlander's 'Orthoscopic Lenses' show slightly curved lines; this might be easily explained by the great haste which he was obliged to use in carrying out his imitation. The 'Orthoscopic' procedure executed by him differs an immense deal from the wearisome mode which is applied and used by real science for the production of a novelty. This 'Orthoscopic' proceeding does not want long formulæ, carefully calculated tables, troublesome examination of the properties of the glass, exact execution of the curvatures according to the given radius, &c., &c. At all events it is easier, and not so troublesome. It is very simple, and executed in the following mode, viz: Waiting quietly till Professor Petzval has executed labo-

riously any new production in optics; there is obtained a specimen of it; the lenses are taken out of their mountings, moistened, and tried whether they fit one of the many grinding dishes of iron, of which every optician possesses a great store. The grinding dish which shows the most contact, is the right one. A difference of some inches in the radius of the curvatures is considered in this kind of proceeding of no great importance. There is also a store of glass; a specimen of it is chosen as most likely to suit the purpose. No investigation is applied because it is too wearisome, and requires time and knowledge. The only care to be taken is that the lens of crown glass is not made of flint, or *vice versa*. This expeditious mode of making an invention does not quite originate with Mr. Voigtlander; on the contrary, it is very old. His merit is chiefly in having invented the name 'Orthoscopic.' It is a very nice name, and the want of it has been felt long ago, because the Latin *plagiare plagiatum*, is too vulgar, and has been applied only to common scrawlings of *soi-disant* authors. But 'Orthoscopic' is pleasant and elegant, and sounds well almost in every language. For instance, how agreeable sounds the advice to a young assistant in optics, 'Try and make some invention in the Orthoscopical way,' or 'I am now occupied with making Petzval's lenses Orthoscopical.' It seems therefore quite sure that the invention of the name has been more wanted than the invention of the lens. However, in spite of this beautiful name, there are remaining some little faults, the straight lines get sometimes crooked, there is something left of the chemical focus, and some other little amiabilities. At all events the 'Orthoscopic procedure' has been so far successful, that a committee of several names of the first photographers *de la grande nation* have paid acknowledgment to his production of the fine art of 'high Orthoscopy.'

"*The second ability* which my lens possesses, is the *considerable sharpness of the picture*. You will be able to obtain a better idea of it, if I state that I have constructed a telescope, mounting two of these view-combinations together, one with three, the other with five inches diameter, to which is added a terrestric eye-piece; the first one allows a magnifying power of 40 times, the other one of 80 times, therefore about as much as we demand from the best telescopes by the given proportion of aperture. Dietzler is now engaged in constructing such a telescope for yourself, and you may expect to receive it shortly. But please do not believe that these lenses were selected by myself, that they are isolated cases, which are expressly done for the purpose of rendering such excellent services; not at all,—on the contrary, all the lenses which you have obtained, and which you will obtain from the manufactory of M. Dietzler, and which are marked with my initials, are quite as good and perfect. Those telescopes require a careful rectification; they are what we call dialytic, and possess the well-known peculiarity of being exceedingly sensible to the distances between the two constituent lenses. One hundredth part of an inch shows a very remarkable difference, and another eye-piece, or another diaphragm requires also an alteration in this distance. It was therefore necessary to mount the two constituent lenses in a mode that they are moveable, like what is done in the dialytic telescopes, and even in such an exact manner that the centration of the lenses is not lost. A peculiar construction of the mountings is required for the use of those lenses as a telescope.

"To speak with numerical certainty, the picture of the view-combination, being carefully rectified, is so sharp that it can be examined by a microscope of $\frac{3}{4}$-inch focus, or it allows the application of a magnifying power of 12 times. Should you think perhaps this to be a superfluous degree of sharpness, then please to consider—

"1st,—The full extent of this sharpness is only quite available in the centre of the field of view, and decreases a little to the edges of the picture.

"2nd,—It was my aim to construct the lens for the purpose of copying maps to the fifth part of their scale, and even in such a manner that by copying, nothing be lost of the details of the original, in so far that we are able to observe in the copy distinctly all the contents of the original by means of a microscope of five times magnifying power, or almost 2-inches focus.

"3rd,—In using an instrument for photography, there is always something to be sacrificed;—therefore we must possess something superfluous for the purpose of being able to sacrifice something.

"*A third quality* of the new combination of lenses is *the equal strength of light* from the centre to the utmost corners of a surface of the image of 16 × 12-inches, or of a circle of 20-inches diameter. If we compare the same in this respect with the combination for portraits, we shall find a superiority of 1: 10, because the picture of the combination for portraits has only a round spot in the centre, of about a little more than 2-inches diameter, where the light is quite full and equal;—from there to 6-inches the strength of the light decreases to half of its maximal value, and passes from there very quickly to 0.

As I observe in the Journal of the Photographic Society, two members of this respected Society have examined my view-combination with respect to the field of view, and strength of light,—both of them, I think, have examined too slightly. I am obliged therefore to observe, that we can understand, under field of view, various matters. For instance—1st, the angular extent of the space where the strength of light is constant;—2nd, the larger angular extent of the other space where the strength of light decreases, without a diaphragm, to half of its value. But we must well observe that this can be only supposed if there is no other obstacle or wrong influence, for instance, any interception by mountings too long, or by cameras too small for the picture, &c. An examination of the field of view in this precise meaning, and a comparison of the same with other lenses, would lead, no doubt, to other results.

"I would also request the favour of the other member of the Society to try again, in spite of the inferior strength of light, my new combination for taking portraits and groups of figures, under favourable circumstances. It is quite sure he would be remunerated for a longer exposure of $2\frac{1}{2}$ or 3 times more, by the sharpness, correct delineation, and plastic appearance of the picture.

"However, it was not my intention at all to dispose of a former production of my own by a new combination of lenses; on the contrary, I wish only to increase the richness of optic means. I have not calculated this lens expressly for the purpose of taking portraits, and I do not demand to use it for this purpose. But I myself would, under favourable circumstances, always use this instrument, and only use the first combination in lack of light, or on objects which cannot be taken too quickly.

"These are the abilities which I desire to be searched for in the new production of optical science. I watch still the execution of them in Dietzler's factory, and all these productions are examined by myself, whether they really possess the required qualities. But you will perceive that I cannot take this trouble for ever, but only until the photographic public may become sufficiently aware of the abilities of the instrument, and be able to judge for itself. I wish, therefore, that you would make known the contents of this letter to the English public.

"It has not been approved that I did not publish a description of this new lens. This will account for it. It has been done because no one is able to judge from the description of an optical instrument, whether it is good or not. Its theory ought to be compared with its execution. Such a description would have been useless so long as the object in question could not have been examined in reality. Now I will give it.

"The combination for views, groups, &c., consists of two achromatic lenses. The first one, whose constituent parts are cemented together, is almost plano-convex, the convex side turned to the object. The second achromatic lens is placed at a distance from the first one of about one-sixteenth *of the focal length* of the first. Its first constituent lens is bi-concave, the slighter curvature turned to the object, the stronger one to the picture; the second constituent lens is concavo-convex, the concavity turned to the object, the convexity to the picture. This description may serve for the purpose of directing any photographer how to place the lenses again in their mountings if he should have taken them out to clean them. Any other use of such a description of an optical instrument can hardly be expected.

"Some of the fighting men in public life might perhaps ask, why I have not yet published the theory of this new production of mine? The reply is, the theory is a corollary of the general analytical researches which ascertain the course of a pencil of rays through a system of any number of refracting or reflecting surfaces of revolution. It will occupy about two volumes of the three of my new work upon Optics, the publication of which will begin, after the publication of my 'Integration of the Linear Differential-equations' has been finished. As a matter of course I cannot easily separate the theory of a single optical instrument from the great structure of science.

"You have also mentioned to me, that complaint has been made that the camera does not possess any contrivance for moving the lens up and down, and to and fro. I do not consider it in this case very practicable. I have preferred to give a larger surface to the ground glass, and to obtain the same result by a moveable set of compartments in the sliding frame, but without demanding that anybody else should have just the same view as myself.

"I have the honour to thank you very heartily for the active mode with which you have so kindly assisted me in the propagation of clear and precise conceptions in Optics. "PETZVAL.

"Vienna, April 12th, 1858."

We shall be very happy to receive for insertion any remarks of M. Petzval with respect to our article on the Orthoscopic Lens, which appeared in No. 49. [ED. P. N.]

VOIGTLANDER VERSUS PETZVAL.

To the Editor of Photographic Notes.

SIR,—Enclosed with this, I hand you a copy of a letter I have received from M. Voigtlander, in answer to the letter of Professor Petzval, addressed to Mr. Paul Pretsch, and which appeared in the *Photographic Notes*, of the 15th of April. I shall feel much obliged by your inserting it in your next number.

Yours, very truly,
GEORGE KNIGHT.

2, Foster Lane, London, May 1st, 1858.

"To GEORGE KNIGHT, ESQ.

"DEAR SIR,—I have received yesterday the Journal which contains the letter of Professor Petzval, and though very unwell and scarcely able to write, still I hasten to forward my answer to it, and beg you will cause it to be inserted in the same Journal. I have written it in English, so as to prevent any misconstruction taking place by a translation, and hope, as a foreigner, to meet with indulgence for any grammatical errors. When writing my letter to M. Lacan, in Paris, about the lens of Professor Petzval, a translation of which will be found in the *Photographic Notes*, No. 45, I was fully aware that it would meet with an answer from Professor Petzval, indeed I was expecting its coming down upon me, crushing and thundering, like an avalanche; but my astonishment has been great, when, prepared to encounter a giant I only met a dwarf. The letter of Professor Petzval, instead of containing precise and clear statements, is nothing but a compilation of sarcastic attacks, which have nothing to do with the object in question, and such assertions as will be easy for me to prove as founded upon nothing, and opposed to facts and truth. The dislike to enter into any controversy with Professor Petzval, which has caused me to keep silence for 14 years, on various matters connected with him, not even asking him any explanation about his more than strange conduct towards me, would induce me to take no notice of his letter, should my high regard for public opinion compel me not to act differently. Without wishing to trespass upon the patience of the reader. I must needs go to a certain length to give a clear view of the whole case, and must, for that purpose, touch on my former connections with Professor Petzval.

"It may have been a year after Daguerre's discovery, that, when calling upon Professor von Ettingshausen, I was asked by that gentleman whether I could determine the refracting and dispersing power of different sorts of flint and crown glass? Answering in the affirmative (having been occupied for a long time in determining these questions), I was informed that Professor Petzval had made the calculation of a Photographic Lens, which could not be executed for want of the qualities of the glass to be employed. Professor von Ettingshausen asked me to call immediately on Professor Petzval, giving me a letter of introduction to him, saying, that by furnishing the means to execute this lens I was rendering to the world a great service, and securing for myself a high reputation; I presented the letter to Prof. Petzval, was well received, furnished the above-mentioned qualities of the glass, which formed the foundation of the calculation of two combinations of lenses executed by me, the one well-known since 17 years: the other, the same as now presented to the world by Prof. Petzval as newly-constructed; the original drawing of these two lenses, from the hand of Professor Petzval, together with the statement of the curves, *is still in my possession.* Both the lenses were examined by Prof. Petzval, but not finding them as perfect as he wished them to be, they were put aside, when, some time afterwards, urged by me to have the lens for portraits practically tried by M. Marten, and the results having been found surprising, I was authorised to make this lens known. Professor Petzval intended to apply his new theory to all optical instruments, and I was to do the practical part; our connection grew a very intimate one; we made another quick-working lens, a dissolving view apparatus, and the opera-glasses, with achromatic eye-pieces, well-known, particularly in England. I then also constructed lenses of a larger size; besides all this work my whole time was devoted to Prof. Petzval, in assisting him in his researches, inasmuch as I made all the various apparatuses necessary to him, when his conduct towards me became so very strange and inexplicable that I could not find it any more consistent with my honour to pay further visits to him, and our connection was broken up, without my knowing for certain what the motives of Professor Petzval were, though I may have had some vague ideas about it. He then allied himself with another optician, whom he soon deserted likewise, and is now connected with M. Dietzler, a very able mechanic, who, when still in Vienna, made part of the brass mountings of my lenses. Since the time our connection was broken off, (during some 15 years), with the exception of an improved dissolving view apparatus, nothing new appeared, only from time to time a pamphlet was launched into the world promising wonderful things, which were to come; the last of these reports were declared in England to be 'a tremendous flourish of trumpets,' and they are regarded much in the same light in Germany. I said nothing new appeared till last year, when the so-called 'new lens' came out, and which I recognized immediately as alike in principle and with little differences of the curves to the one I had made 17 years ago, which discovery caused me to address to the Academy of Vienna a memorial, in which I raised a protest against this lens being called new. I claimed my right, not only to the priority of the first execution, but also of my partnership, in some measure, to the scientific part of the work. I offered to show that this lens, not new in principle, was to be called identical with the one constructed 17 years ago, in spite of the apparently great difference of some of the curves, as the effect of both lenses was much the same, only the focus of the new lens is shorter, and a mere revisal of the former calculation of Professor Petzval, or even a new calculation, could never vindicate for this lens the name of new. The way to obtain a certain object may be new, but that denomination cannot be transferred upon the object itself, if this remains in both cases much the same. I chiefly wished to show by this memorial that Professor Petzval was guilty, in my eyes, of an injustice, by not mentioning that this lens had been made 17 years ago by me. As to his appearing with the lens at all, he was certainly at full liberty to do as he liked; and I further wished to prove that by appearing now with this lens I was not guilty of an infringement of the rights of Professor Petzval.

"This is the outline of the historical part of the affair, in chronological order,—a preface to my now passing on to the letter of Professor Petzval. I shall touch on the various points of it in the same order as they present themselves. Regarding my assertions about the new lens, I refer to my statement on that subject. I protest against having mentioned the new lens amongst the 'unsuccessful' trials; in my memorial I said that both the lenses have been put aside, not being found *quite satisfactory*; in that memorial I never mentioned Professor Petzval not being satisfied with my productions; the copy of that memorial is before me, but I cannot find even the slightest allusion to it which might be misconstrued; this would be contrary to truth, little flattering to myself, and carrying modesty rather too far. I must declare this as an invention of Professor Petzval. With regard to the observation of my speaking of the differences of the curves as little things put forth in such a *railing* manner as to show, as it were, my ignorance in such matters, I must assist the memory of Professor Petzval, and remind him that some time before I had the advantage of his acquaintance, I had already made telescopes according to my own calculations, and by means of my apparatus, telescopes which have been pronounced by men like Gauss and Schuhmacher, and others, as amongst the best they had ever seen, and in some points even superior to those of Fraunhofer. Professor Petzval will therefore oblige me by not assuming towards me a language which may be excusable when addressing a mere mechanic, particularly as he is aware that I have constructed such instruments as will give me the means of executing any given curve up to 0·005 of an inch, by which it may well be inferred that I know perfectly what I am about when pretending that the differences of the curves of the two lenses in question are of no importance. I am now coming to a part of his letter which I might well call amusing, should I not wish to avoid falling

into the same fault as Professor Petzval. *I* am to be the inventor of the chemical focus. "I am *not* working according to his calculations," and by mentioning his name in my list of prices I have made myself guilty of an *ingenious method* of putting his name by the side of mine.

"Regarding the first question, Professor Petzval allows that I have made the first lens according to his calculations. Now it is a fact well-known, that soon after the first portraits were made, we found that, when setting the eyes to the point, the ears became sharp, which induced Mr. Marten, not to set to the point on the face at all, but to do it on a print held just on the nose of the person whose portrait is to be taken; some time afterwards, Professor Stampfer, an authority in such matters, observed to me that, in order to get the copy of an engraving very sharp, he found that the lens was to be screwed out, after having been set to the point, which proved the difference of the visual and the chemical focus; later, when constructing my 3-in. lens, of course that difference became more apparent; it was then simply called 'Chemical Focus,' but not by me: and men like Claudet, Zantedeschi, and others, began to write about it; now, in the name of all that is reasonable, I wish to know how *I* can be called the 'Inventor of the Chemical Focus?' *I*, who, as far as concerned the working of the lens, was only the instrument of Professor Petzval. The best of all is, that, in an indirect way, I can prove that this first lens could not be free from the chemical focus, by Professor Petzval's own statements; in one of Professor Petzval's reports to the Academy of Vienna, he says that a Photographic Lens can only be free of the chemical focus when the achromatism was determined differently, as is done for the object-glass of a telescope; in another passage he pretends that all the lenses made according to his calculations have no chemical focus; now combining those two assertions, every one should naturally be led to the conclusion that the achromatism of the front lens must have been determined in the way pointed out by Professor Petzval; but, as has been seen in the beginning of this, this part of the work has been done by me, and it was done just in the way I always followed when constructing an object-glass for a telescope; it is pushing the thing rather far to pretend that all the lenses made according to his calculation were free from the chemical focus, when there are still hundreds of lenses of the very first period existing, which may prove the contrary, *and in the same report I mentioned: Prof. Petzval allows even his new lens having a difference of focus for a very sensible eye.* I should indeed like to know how Professor Petzval could have been able to avoid that difference in the first period when nobody was yet well aware of the great difference in the chemical action of the differently coloured rays. With reference to my not working according to his calculations and putting his name in my list of prices, I have simply to say that I was authorized to do so at first, and as all my other lenses have been only the result of multiplying aperture and curves of the first lens with 1·5, 2, &c., I could not consider them changing, by this simple process, their nature, and not being any more according to Professor Petzval's calculation. Should I perhaps have said they were calculated by me? I suppose in such a case Professor Petzval would have been amongst the first to proclaim this as the height of presumption, and with perfect right too; it is very obvious that, after having sold thousands of lenses, now up to the number of 7,200, I might well have dispensed with his name, had I not continued to put it on my list in justice to him. I cannot find it fair to put such misconstruction upon an act of mine done in deference to Professor Petzval. His next attack is nothing but a very poor attempt to ridicule me, there is little merit in such a proceeding and no difficulty at all, for as the French proverb has it: *du sublime au ridicule il n'y a qu'un pas.*

"I have never laid any pretensions to my having *invented* that name. Should Professor Petzval not be aware of the fact that this name has been introduced by M. Kellner, of Wetzlar, a very able optician, for his achromatic eye-pieces, I must take the liberty to tell him so. I have adopted that name as it seemed to me well applied. I have done so with the particular object in view, to distinguish this lens at once from the old combination, and I am happy to say that in France and England the name was considered well applied.

"Professor Petzval goes on saying that I had declared his camera not *necessary* at all, since *every* thing can be obtained by an ordinary camera, I beg the reader will take the above-mentioned Journal in hand and read my letter, in which, after speaking with great deference of Professor Petzval, I only say 'I cannot understand why,' &c., &c., and 'some very fine results may be obtained,' &c., which, as every man must allow, is quite a different meaning. Either Professor Petzval is not sufficiently conversant with the English language to understand that difference, in which case I should advise him to look out in future for a good translation, or I must consider his proceeding, if not as a malignant interpretation of my expressions at least as a forced construction on my words.

"To deduce from the circumstance of my being ignorant of the arrangement of his camera, the proof that I could not have known for 17 years his new lens, is more than common sense can understand. I am feeling quite at a loss to find any answer to such new logic, but shall leave it all to the numerous photographers in England, already in possession of my Orthoscopic Lenses, whether they cannot obtain very good pictures without Professor Petzval's camera, by which fact an indirect proof is furnished, that without being aware of the peculiarities of this lens, it may still be used. I find that I have passed over the question 'why I have not made that new lens when known to me 17 years ago?' to which I have to reply that the success of the lens for portraits has been such as to make it impossible for me to take any more work in hand, and having been allied at that time with Professor Petzval, my actions in this respect were dependent upon him. Latterly, I forgot the whole affair, as I explained in my memorial to the Academy.

"Hitherto the optician has spoken to Mr. Petzval the Professor, with a certain restraint I considered due to his superior knowledge, but the scene changes entirely when touching upon a passage in his letter which, combined with his whole language, appears

to me to be so very personal that I shall not hesitate to meet him on his own grounds. I refer to his saying: 'I might be glad to put my name beside his,' I must take the liberty to ask him whether by this he means to consider an alliance with me dishonourable to him, either as regards my position as an optician or my quality as a gentleman, I must desire him to come manfully and openly forward, speaking out what he has to say against me, or to desist from using such equivocal expressions, otherwise I should consider myself at liberty to designate such proceedings by their proper name; as I am inclined to believe that Professor Petzval, standing so long a time upon a somewhat self-erected height, has made him lose the faculty of seeing the realities of life in their proper colours, I must take the trouble to remark to him, that, with the exception of his great superiority over me in all abstract sciences, in point of good breeding and general education, I consider myself fully his equal, and that in point of honour, I am still as susceptible as I was 15 years ago, when forced to call him before the magistrate, to give an explanation about some disrespectful expressions he was reported to have used regarding me. He then denied ever having said any such thing, adding, to confirm the truth of his assertions, that it was absurd to suppose he would make use of such expressions with reference to a gentleman like me. I beg to state to Professor Petzval that I must insist upon being regarded by him still as the same gentleman. Professor Petzval, making an indirect comparison between our names, I venture to observe to him that his name is of a standing of some 20 years, during which time, with the exception of his own certainly eminent work, he has enlightened the world only by promises of wonderful things, whilst my name has been handed over to me by my father and grandfather, who both, for more than a century, have done honour and credit to it, to whose efforts I have joined mine, and I flatter myself not without success. I shall further permit myself to say that *my name* has never been subject to a public reprimand, which has been the case with *his*, about a year ago, when reporting to the Academy of Vienna about the work of another man of science, he allowed himself to use such an expression as called forth the indignation of the assembly and caused the reprimand I was speaking of in the Journal which gave me an account of that meeting.

"Lastly, I beg Professor Petvzal to consider that he has thrown me the glove in a country where, even as a foreigner, I may enjoy the greatest of all earthly blessings, that of freedom of speech. I certainly am not seeking for a quarrel, as my having kept peace for 15 years may show, and I am now ready to decide the differences of our opinions about that lens in a more becoming way than giving to the world the, at all events, displeasing spectacle of two men quarrelling, who were well fit, by their united efforts, to greatly promote science and art. However, if Professor Petzval throws me the glove again in a like manner, I shall not shrink from taking it up, but, when entering the lists again a second time, I may most likely change my defensive position into that of the aggressor, and he will yet have to learn that, very far from having exhausted my strength at this first onset, I shall as well know how to attack him as I have known how to defend myself.

"I had very nearly forgotten that I have yet to repulse the last of Professor Petzval's attacks, viz., 'my memorial having been rejected by the Academy as an absurdity.' It is quite true that my memorial was not accepted, but when this was noticed to me it was accompanied by a somewhat detailed explanation, and the wish expressed I should get by this the conviction that the Academy was not in a position to act differently, inasmuch as the whole object did not come within the sphere of its operations; and it was stated, that if such a memorial had been presented even by a member of the Academy it could not have been accepted, the Academy never entering into such discussions; besides this, I am in possession of some letters from one of its members, from which it appears that my memorial was very far from being regarded 'as an absurdity.'

"I cannot refrain from advising Prof. Petzval to get better information before he ventures the attempt to make his personal view of this case pass off as the opinion of a body of scientific men.

"I have now done with Professor Petzval.

"It has been reported to me that in England some persons have made it their business to spread about certain rumours regarding me, such as my having been cast off by Professor Petzval, my not working according to his calculations, my only having played the part of a common workman in that affair, being void of any learning, and some such things. I beg these gentlemen to desist from such endeavours, or I shall, on my next coming to England, treat them in the way calumniators deserve.

"Before I conlude I must address a few words more to the impartial readers; should some of them consider my language rather strong, they have to bear in mind that the language of truth, like the path of virtue, is very often rough; they must allow that an honest man must needs feel indignant at being assailed by a compilation of vague assertions, ungrounded, untrue, and invented, well calculated to show the weakness of the cause instead of supporting it, and all this put forth in a manner little in keeping with the object in question. Let the reader compare with this *my* statements, and I hope the conclusions will not be found difficult. I will not refer to my name and to my social position in life, which to many will afford sufficient guarantee: but I am ready to prove every word I have said, by *witnesses*, *letters*, and *documents*. I am writing now a longer memorial on that subject, in my own language, (at which I feel certainly more at home), which I shall publish, and, should this affair be carried further, I shall perhaps come to England to plead my cause personally, and to give positive proofs of all my assertions to all those who take an interest in this case. "VOIGTLANDER.

"Brunswick, April, 1858."

We enclosed a proof of M. Voigtlanders letter to Herr Pretsch, and in reply he begged us to insert the following remarks with respect to it:—

To the Editor of Photographic Notes.

SIR,—Although I possess already quite enough of adversaries, and should therefore not like at all to begin a new controversy, still my name being connected with the introduction of Prof. Petzval's productions into this country, and I am proud of it, I cannot abstain from making a few observations.

Professor Petzval's letter is a long one, but it contains much information, which will be, I think, acknowledged by many people. Mr. Voigtlander's letter is also a long one, but it contains chiefly explanations about himself.

I acknowledge that "freedom of speech is the greatest of all earthly blessings," but I think, like many Englishmen, that if we accost the public, we ought to consider that we do not accost a public-house.

In spite of such a very long "speech," it is undoubtedly proved that the lens in question is Professor Petzval's production. Mr. Voigtlander himself asserts, curiously enough, "latterly, I forgot the whole affair;"—I suppose he has been only put in mind of it by my paper, read in December last, before the Photographic Society in London.

Most likely Professor Petzval will himself reply to Mr. Voigtlander's letter.

PAUL PRETSCH.

London, May 7th, 1858.

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEARS 1856-7.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Continued from No.* 48.]

We found nothing that suited us in Lynton, and therefore soon wended our way down the steep ascent that had required six horses to draw us up the night before, and when fairly down, we were as much delighted with the scenery which met our eye as we had been at Lynton, and congratulated ourselves on the chance that directed our steps to this most favoured spot. Were I to make a comparison, I should say that the two places I have seen closely resembling it, only on a far grander scale, are the Baths of Lucca, and the Baths of the Lady, in the Carpathian Mountains; but in England I should think it unique, at least I have never, in all my ramblings, seen anything like it. Here we determined to rest, and were soon comfortably housed in what was formerly the Hotel, now removed to another part of the village, the influx of visitors requiring now better accommodation. No description, in my humble opinion, can do justice to the beauties of Lynmouth. He who has sung its praise so well, and who has described the numberless beauties so truthfully, (I mean the late Mr. Eagles), still fails to give any idea of such scenery as this, which must be seen, and which no words can paint, not even so skilful and able an artist as he whom I have named. Its beauties are truly endless, for turn your steps which way you will, fresh ones meet your eye; the host of artists that are each summer to be seen, dotted about in every direction, and under every description of grotesque and picturesque form, testify to the truth of these remarks Now too may be seen mysterious machines, mounted and unmounted, on stands; even flys, fitted up with yellow blinds, and laden with boxes as unlike the ones our forefathers used to travel with as possibly can be, in fact gentlemen photographers, who hide their heads, not under a bushel, but a black apron, and who, with watch in hand, seem ever anxious that time should pass away faster than it does. I one day, in the valley of rocks, counted no less than six of these perambulators, each carrying away portions of the valley, and seemingly quite satisfied with the spoilation they had so harmlessly effected, leaving those picturesque rocks intact, and ready to be taken again and again for many generations to come. May they long remain, and never be subject to worse treatment, for they seem well nigh to defy the all-devouring hand of time, and though grown grey and covered with moss and lichen-wort, still no crumbling is visible.

I am inclined to think the wonders of the Valley of Rocks, at Lynton, a little over-rated, although, under certain atmospheric effects, it is certainly very grand. The North Cliff Terrace Walk, too, is perhaps almost unique in England, and, wanting the deep blue and cloudless sky of Italy, I was almost reminded of the road to Castelanan. The glorious feature of the landscape, the Castle rock, and the far-off hills of Wales, with the billows breaking at the foot of the cliffs, hundreds of feet below, produce an effect that is not often met with in our precious island.

I remember, on my first visit to Rome, I was scarce half-an-hour in the Eternal City before I found myself wending my way towards St. Peter's, and so at Lynmouth, directly that lodgings had been found, we started off to the well-known and often described place of Waters Meet. We were enchanted with the road thereto, but must I own to a feeling of disappointment, on reaching the termination of our walk, and like many others of those localities, so lauded in the printed descriptions, found the reality by no means equal to the description.

Having nothing to hurry us away from this really most lovely and favoured spot, we lingered on for nearly six weeks, and took between forty and fifty good negatives of the place. For a description of its scenery, I would advise any one to purchase the Sketches, written by the Rev. John Eagles, of Bristol, and detailing, in most graphic language, all the marvellous points of beautiful scenery here to be met with.

Although there is no great difficulty in reaching this place, yet, as often now occurs in those localities, distant from any railway, there is much trouble in getting out of it, from the hilly nature of the country, heavy luggage, (and the boxes of a photographer are never very light), is objected to, and charged heavy prices, and must be sent before. In short there are many of these little obstructions to be overcome, and no little extortion attempted. However we at last tore ourselves away, and proceeded *via* Barnstaple, to Dawlish, wishing to pay a visit to the many watering places along this part of Devonshire coast, formerly most fashionable, and still much frequented. Dawlish is a pretty,

bright and sunny place, and quite worth a visit; the red sandstone cliffs, which are pierced above by thousands of rabbits, and the sand-martin, and below by the railway tunnels of the South Devon Coast Railway, standing out in bold relief, and from the wash of the sea, forming most picturesque headlands, and isolated rocks in every direction, and all coming out well, in any pictures that I took. Here I managed a dozen, and some of them very nice. An easy ride conveys you on to Teignmouth, having all the appearance of one of those watering places that in former years attracted its crowd of visitors. There is the pile of buildings so necessary to the requirements of our respected parents, the Assembly Rooms, and the Circulating Library and Reading Rooms, with, for ought we know to the contrary, its wonted collection of Pamelas and Penelopes; but the place now looked, to my eyes, deserted, and like Weymouth, seemed as if its glories had passed away. Nor did I see anything very tempting for camera work, so instead of loitering on my road I determined on proceeding still further along the coast to Torquay. Here there is evidently much to be done, not in the town, but in the environs. Babbicombe is still very pretty, though this once secluded little nook is now, like others, being invaded by the mean and ugly villas that are, in every direction, in around Torquay, covering each acre of ground. It looked to me a hot and dusty place, and too large for any quiet or repose. In fact I felt disappointed with this my first visit. Totness next engaged my attention, and here several very nice photographs may be taken. Berry Pomeroy Castle, too, is close by, though, from its being so closely shut in by trees, it is not an easy matter to get any good view of this fine ruin, and which, from the neglected state it is allowed to remain in, is fast disappearing. I never saw a fine old ruin in such bad preservation, overgrown with brambles and nettles, broken tables and stools strewed about, the vestige of the last excursion train party, broken necks of bottles, and other remnants of the visit, being anything but in keeping with the hall where once a vastly different assemblage were wont to congegrate and converse.

From Totness, a row to Dartmouth is of course necessary, and although I could see nothing in the scenery to permit its being called the English Rhine, still it quite repays the tourist, and should by all means be visited if only to permit an inspection of that most picturesque and quaint old town Dartmouth. Here a week will not suffice to take all that is worth taking;—old gables, the remains of the Castle;—nice bits of shipping and boats;—in short there is much here to repay the photographer, and very different from any other English town.

This formed the termination of my Photographic Tour in that direction, and I retraced my steps to Dawlish. I now proceeded in the direction of Exeter, to visit and photograph Powderham Castle, the seat of the Duke of Devonshire, and well worth taking; and Exmouth, where I did not find much of interest.

I now proceeded to a greater distance, determining on seeing Sidmouth before finally leaving the South Devon Coast, and here you have again recourse to the old four, or rather three-horse coach, and from its being some miles from any railway, it is apparently languishing, and looks deserted and poverty stricken; nevertheless it is a very pretty and picturesque bathing place, and the fine cliffs of sandstone which form the termination of the Bay, stand out with great effect. Near here is the restored Church of Ottery St. Mary's, quite worth a visit, and which makes a very good photograph. In the internal decoration, large sums have been spent of late, and for a restoration in the mediæval style, a more beautiful specimen cannot be seen anywhere in England.

The weather now getting cold and stormy, and the year fast waning, warned us to make the best of the remaining few weeks, and before packing up for the winter, and bidding adieu, till Spring, to the pursuit, which of all others, to my mind, gives a larger allowance of health and enjoyment, one other place remained on the list marked out for the Summers tour, and that was Weymouth: so bidding adieu to the warm and relaxing climate of Devon, we soon found ourselves among the chalky downs of Dorsetshire, and entering the old town of Melcombe Regis, so favourite a resort, in former days, of old George the Third. It has not in any way changed in appearance; it is just the same as it was in its palmy days. Here, from the dreary country around, there is little to interest the Photographer, Sundstert Castle and the Island of Portland being the two principal points of any interest. The new Breakwater gave me some very good pictures, and the dreary and wild scenery of the back of the Island, with its weather-beaten cliffs, afforded some beautiful studies of cliffs and rocks, so admirably adapted for Photographic display. This concluded a nearly seven months tour, pleasurable, profitable, and health-giving; and here, for the present, I shall conclude this long account of my rambles and proceedings in 1856, promising, if you so desire, at no long interval to forward you the account of 1857, and which, from its more extended and varied route, may perhaps prove the more interesting of the two.

In 1856 I became possessed of 170 good negatives, viz., Cheddar 8; Dawlish 8; Lynmouth 36; Lynton 5; Weymouth & Portland 26; Wells 4; Weston 10; Sidmouth 10; Teignmouth 2; Malvern 32; all of which, notwithstanding the rough roads they have been over and the rough handling they have received, and the number of copies, over 2000, that they have afforded me, are still, I am happy to say, as perfect as when they were taken, and are still, I hope, destined to do me good and profitable service. I last year, 1857, obtained 180 negatives, and from these, with four copying frames only, I obtained 2800 positives: this consumed 3lbs. 6ozs. of nitrate, four pints of collodion, and a ream of Marion's paper. And now, to prove that after this long story what I have stated is correct concerning the success of my mode of manipulating, I send a few examples of positives, selected at hazard from my portfolio of duplicates, which, I am happy to say, is never allowed to become overstocked, and abide your decision as to their merits, again most conscientiously recommending the "Archer Camera," as being the only one that combines *every* requisite for field-work;

and I would say to the sceptic, make a trial, and I feel quite sure the result will give you satisfaction.

I beg to remain, Sir, truly yours,

J. W. G. GUTCH.

9, Upper Victoria Place, Clifton.

—We have received for insertion the account of Mr. Gutch's excursion of 1857, and shall not delay its insertion, as the season for photographic tours has now commenced, and many of our readers may gather useful information from his experience.

Many of Mr. Gutch's subjects are extremely fine, and all that we have seen far above mediocrity.

[ED. P. N.]

THE ELLIOTTYPE.

(Extract from the Specification of Mr. Robinson Elliott, Artist, of South Shields.)

"I take a piece of good glass, as free from specks and impurities as possible, of the size I intend the impressions to be; I next, with a brush, do the surface of the glass over with a thin transparent paste, or any other similar compound, as gum-water or glue-size; I next fix the glass in a frame. Should the picture which I am about to copy be the same size as the glass, I place it underneath, and with some tracing implement, as a fine-coloured point of chalk, trace the outline of the picture on the surface of the glass covered with the transparent medium I have described. Should the picture, however, not be the same size, but larger or smaller, an outline is made on paper of the desired size, and placed under the prepared glass instead of the picture, and traced in the same manner. But if the artist prefers it, he can make his outline at once on the prepared glass, which is perhaps the better plan. The outline being completed, I place a black or dark-coloured cloth behind the glass, and proceed to paint the picture on the glass with one colour. The more opaque the colour is for this purpose the better, as the colour is put on for the purpose of obscuring the glass, and of such consistence and thickness as may secure the required gradations for obtaining the lights of the picture when the photographic impression is taken on the sensitive paper. Where the paint is quite solid or thick on the glass, the impression on the paper will be white, and underneath the transparent parts of the glass it will be dark in proportion to their transparency; the pure glass will give the darkest shades, the light passing through such places without obstruction, and acting with full power on the sensitive paper underneath. It is better to use a colour of a light hue, in order to see easily the effect of the work as it progresses; white lead, combining opacity wtth a light hue, is the best. Where sharpness is required in the lights, a little black may be used with good effect, as it aids the obscurity caused by the thick white; the black is to be used pure by touching sharply over the white when the white is dry; it is, however, not always necessary. While the artist is at work, the dark cloth serves the purpose of showing during the progress of the painting the various gradations of shadow in the picture. When the picture on the prepared glass is worked up to the amount of finish deemed necessary, it is completed by scraping off whatever paint is not required with a scraper or etching tool, and thus clearing and sharpening the shadows. This painting on glass being completed, the cloth is removed, and the glass then has a very different appearance. Before the cloth is taken away it looks like a brilliant engraving; but when the dark ground is removed, and the glass held up to the light, the shadows are all more or less transparent, and the light proportionately opaque. I now take a piece of sensitive paper the size of the glass, and prepared in the ordinary way, and place it on the unpainted side of the glass (the other side would reverse the picture), and put the paper and glass in a printing frame, such as is generally used by photographers, and place it in any common window, with the glass outwards, when, if the sun be shining intensely, an impression will be produced on the paper in two or three minutes exactly like the picture on the prepared glass; this impression is then fixed in the usual manner."

**** Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

M. RENAUD SAILLARD'S PROCESS.

To the Editor of Photographic Notes.

SIR,—Permit me to make a few remarks about an article in the last number of your journal. There is inserted a report of the French Photographic Society, stating, among other matters, that M. Saillard had made some improvements in the Electrotype part of my process, "Photo-galvanography." So far as I am able to gather from the given details there, and in the French original, and comparing some communications from M. Laulerie to myself, M. Saillard considers himself as having made an improvement by depositing copper immediately on the surface of my raised picture on gelatine. But this was executed by myself, many years ago, has been repeated afterwards several times, and is also stated in the specification of my patents from November, 1854. It is wrong to suppose that those plates do not require retouching; the degree of more or less touching depends partly upon the quality of the original, and partly upon the cleanliness and care with which all the various parts of the process have been executed.

Parasites are plenty, and there might appear some more. "Judge not, that ye be not judged."

The "break-down" of the Company is an episode which, sad enough, I am obliged to share with the inventor of lithography, Senefelder, whose personal exertions in England were not successful, and whose invention waited *many years* before it became approved of in England. PAUL PRETSCH.

67, Great Portland Street, May 6th.

POSTSCRIPT TO MR. BARNES'S LETTER IN NO. 49.

To the Editor of Photographic Notes.

In all my experiments with dry collodion, I have aimed at perfection. If this cannot be attained by simple means, we must unavoidably fall back upon others, seemingly or possibly more complicated.

Professional photographers require a process certain in its results and upon which they can at all times rely. In fact, it would be extreme folly on their part, to employ a method of working in which failures inherent to the process itself were

to be feared or expected at every turn. Such processes (and the easier the better) will do very well for amateurs with plenty of spare time, little love for labour or trouble, and a genial temperament very easy to please.

In the first edition I advocated the use of collodion alone, unsupported by any other substance. The difficulty, however, experienced by beginners in preparing a collodion always suitable for the purpose induced me to lay greater stress upon the use of the albumen as a protective sub-stratum to the collodion, in the appendix published in December, 1856.

The use of old collodion is attended with this great disadvantage,—if, during the development the slightest excess of silver is employed, all the finer details of the picture are completely lost, and sky and water become dotted all over with minute holes, visible in the positive print.

In order to obtain perfect results upon dry plates, with perspective, distance, details well-defined, the collodion itself must be in a perfect state in every respect, very sensitive and newly-iodized, but in this condition its contractibility precludes the possibility of keeping it upon the plate without some protective substance *underneath*.

During my preliminary experiments I used gelatine, both under and over the film, but I found that even by the use of the greatest skill and care it was absolutely impossible always to succeed, the plate being very liable to blister all over.

My views of the requirements are these: The great cause of failure is the blistering and tearing of the thin film of collodion. On re-wetting during development, the solutions permeate the collodion, damp the glass underneath, the collodion expands, slides about the plate, and finally, either blisters or breaks away in flakes. If you have a substance underneath, impermeable to water, the film will not be disturbed. The substance, *par excellence*, for this purpose, is albumen, to the use of which is not attached the slightest risk. Gelatine, when re-moistened, swells considerably, absorbs much water, and when used over the film it retards the sensitiveness of the already not over-sensitive old collodion, which it is necessary to use with it.

Objections have been taken to the use of camphor, as this substance is liable to spoil the nitrate bath when employed for the wet process. This effect certainly does take place when the bath contains a large proportion of alcohol, but not otherwise. In fact, at one time, my sensitive bath was constantly kept saturated with camphor, but no injurious effects were produced. I have disused it lately, my bath containing now a large quantity of alcohol, the addition of which produces extra sensitiveness.

Collodion, it is well-known, becomes slower by age, and a longer exposure has to be given. Much, therefore, depends upon the judgment of the operator. To lessen this evil, and facilitate the manipulation, an equalization of the collodion is necessary. This is attained by the addition of acetic naptha, which certainly renders the collodion slightly less sensitive, but it prevents, to a great extent, any further change; the after-loss of sensitiveness being so limited (even during three months), as to require no allowance to be made in the exposure of the plate.

Plates and Collodion, one week, or one month old, are equally sensitive, so that it is needless to keep separate glasses prepared at different periods.

Should the subject of Dry Collodion prove interesting to your readers, I will recur to it at some future time.

R. F. Barnes.

64a, New Bond Street.

—We are inclined to think that all such evils as blistering and tearing of the film, and want of adhesion to the glass, contractility, &c., may be avoided by using the *proper kind of collodion*, made as Dr. Norris has pointed out, with pyroxyline obtained with hot and weak acids. [Ed. P. N.]

"*A. R.*" Positives transferred to leather are probably permanent, without varnishing them, the pyroxyline film becoming incorporated with the varnish of the glazed leather. [Ed. P. N.]

"*Photo.*" In order to remove varnish from plates, pour a little of the solvent used in the varnish upon the plate, and rub with a rag. If amber varnish has been used plain water and friction will remove it. Spirit varnish is the most difficult to remove, but it gives way readily enough if the plate is heated and a little alcohol applied, and *rubbed* over it. A little Benzole will remove black varnish. Benzole will also remove grease spots from linen, &c.

Before applying spirit varnish to a negative do not heat the plate too much, or in pouring off the varnish the negative may come off with it. Hot and strong alcohol will remove the pyroxyline film from the plate. Be careful therefore in using spirit varnish; but with care this varnish is certainly the best. [Ed. P. N.]

"*T. B.*" Your idea of an operating room is very good. More about it in our next. [Ed. P. N.]

"*Votre bon amis.*" Dr. Hill Norris's process is an excellent one for views, and answers fully all that he has said of it. Procure at first some of his plates. [Ed. P. N.]

"*Jackson.*" Your meaning about the box or tent is not quite intelligible. Please write again. [Ed. P. N.]

"*G. H. L.*" The cheap microscopic slides alluded to in an old number of "Household Words" can be obtained from M. Amadio, Throgmorton Street, London.

☞ *The Communications of "Chemical," "N." E. W. Holmer, "Amateur," "Maitland," "Enquirer," and the Proceedings at the last Meeting of the Birmingham Photographic Society, for which we have not space in the present number, will be inserted in our next.*

We have heard with much regret of the death of Mrs. Frederick Scott Archer, at Bishop's Stortford, on the 22nd ultimo.

Photographic Notes.

JUNE 1st, 1858.

Once more we would earnestly call the attention of our readers to Mr. Pouncy's method of printing positives in carbon. What is to be done in this important matter? In a letter just received, Mr. Pouncy informs us that he will dispose of the process for a hundred guineas; but also that on his last visit to London he registered it provisionally with the view of taking out a patent. Here then is a definite proposition which we are able to submit to our readers; Mr. Pouncy offers them a method of printing permanent photographs in carbon, for one hundred guineas, a sum which could be raised at once if every one of them would subscribe a shilling. Surely the process is worth that. There cannot be one of our readers who would not gladly give a shilling to know it. Well then, shall we see if we can all combine and purchase it?

Here is a plan for that object;—

Let every one who feels inclined to give a shilling for Mr. Pouncy's process forward to us his name and address. We will file all these addresses. If we get a sufficient number we will purchase the process, and publish it in a shilling pamphlet. All we now require are written orders for a sufficient number of copies of the pamphlet when it comes out. It is evident that if we purchase the process on our own account, and incur a great deal of trouble by so doing, a guarantee is necessary, because it would no sooner be published than it might be copied verbatim into any public journal; the pamphlets would then become waste paper, and we might whistle for our hundred guineas.

If then we can secure a sufficient number of orders for the pamphlet we will purchase and publish Mr. Pouncy's process. Should this attempt fail, it seems that photographers will have no help for it but to wait patiently for six months, until the Specification of the process is made public; and then the patent will be binding on every honest man. Besides, it might be worth while for some of us to consider how many shillingsworth of silver would go down the sink, and how many perishable prints be added to our portfolios during these six months. Let the past history of Photography answer these queries; and let no one grudge his shilling for a process which appears to combine economy in the material with permanence of the proof. Admitted that the colour of a carbon print is black, and not red, or purple, or any fancy tint; and also that there may possibly be in Mr. Pouncy's prints a little want of half-tone; but it is equally certain that the whites of the paper are perfectly preserved, and very probable that a black pigment such as carbon might be replaced by others of a great variety of beautiful tints; nor is it improbable that the want of half-tone in the early specimens of a new process may be remedied by improved manipulation. These considerations should, we think, weigh with reasonable men, and a whole season not be allowed to pass away while they remain in ignorance of the most important step in Photography which has been recorded for some years;—in a state of ignorance which may be terminated in a few days, by merely writing a letter and paying a shilling for a book wheu published.

Do these remarks savour of "enthusiasm," or are they not rather consistent with common sense? Time will shew. Meanwhile we leave it to our contemporaries to record, if they prefer it, the *minor* improvements in Photography—to run the changes eternally on the preservative syrups, the modifications of waxed paper formulæ, the vexed questions in optics, which a week's application to the geometry of the subject would settle at once and for ever; and so on, *ad nauseam.* We are surprised certainly, but not less pleased to find ourselves the sole advocates of M. Petzval's new lens, and Mr. Pouncy's carbon printing.

But before we quit this subject of carbon printing we must mention that a few weeks since we received from Herr Pretsch a print, supposed by him to be in carbon, and printed by him in the year 1852 by the following process, as described in his own words:—

"The print is executed in the ordinary way like another positive, but instead of salt or ammonia, carbonate of soda is used. If I recollect right I used at that time a fixing bath of hypo-sulphite, to which was added a concentrated solution of acetate of lead, till it became dull, well stirred up, and then again added till at last it became clear."

With all due deference to Herr Pretsch, whom we respect highly as an intelligent and enterprising photographer, we do not believe this print to be a *bonâ fide* carbon print, but on the contrary a silver print, toned with sulphur and lead. Unfortunately it was got possession of and either mislaid or destroyed by a little rogue named Arthur Sutton, who

lays hands upon all such photographs as are not deemed pretty enough for his papa's portfolio; and as this print was the only one of the kind which Herr Pretsch possessed, the accident is much to be deplored.

In a letter we have received from Mr. Belfield Lefevre, of Exeter, a curious coincidence is pointed out between the dimensions of M. Petzval's new lens and a well-known lens of M. Chevalier, which has been in use for the last seventeen years. The chief difference between the lenses appears to be that the small lens in Chevalier's combination has negative focal length, while that of Petzval has positive focal length; and in the Chevalier the front lens is the smaller, in the Petzval the back lens the smaller. The following table will shew how nearly the dimensions coincide, expressed in centimètres, (two-fifths-of-an-inch):—

LARGE LENS.	CHEVALIER.	PETZVAL.
Diameter	8	8
Focus	— 39	— 40
SMALL LENS.		
Diameter	5	5
Focus	— 85	+ 90
Distance between lenses ..	5	4
Combined focus	— 26	— 63

There appears to be a notion in the minds of some persons that a portrait-lens with a diaphragm between the lenses, is better for taking views than an ordinary view-lens. Now this idea is incorrect. It is true that a double combination gives a finer focus to the central pencil than a view-lens, but it does not give so flat a field, and therefore, when a wide angular field of view is included, the view-lens with a stop in front is by far the best. The view-lens has also the advantage in equality of illumination. The portrait-lens with a stop in the middle answers well enough for stereoscopic pictures, because these do not generally include a wider angular field than 30°, the equivalent focal length of the lens being long in proportion to the breadth of the picture.

Messrs. Anthony, of New York, have promised to send us a minute account of their Solar Camera, for printing enlarged portraits. Mr. Atkinson, of Liverpool, says "it is truly wonderful in its performance. The light of the sun passed through the condenser is equal to the Bude light. It requires care that it is not directed on any of the wood-work, or it would immediately set it on fire. My son has had his cap fired several times in focusing."

The Revd. William Read, of Manchester, has suggested an excellent mode of obviating to some extent one of the great difficulties in out-of-door photography, which consists in giving to the foreground sufficient exposure without over-exposing the sky. His plan is admirable for its simplicity, and we feel perfectly sure it will answer. It consists in turning the stop of the lens through an angle so that its edge may be presented more towards the sky, and its aperture more directly towards the foreground. The *rationale* of this scarcely requires explanation, and it only remains for opticians at once to adopt the principle, and contrive some neat mode of adjusting the plane of the diaphragm to the axis of the lens. The idea is strictly correct in principle.

Some five or six months ago Mr. Gill, of Liverpool, patented a process for taking duplicate pictures at one operation in a stereoscopic camera with a single lens, by means of a pair of reflectors, each of which gives a different image of the object. We find from an American Journal that this invention is quite an old story, having been described by Professor Barnard, of Alabama, in Silliman's Journal of Science for 1853, page 348.

Herr Pretsch has received a letter from Professor Petzval, in which allusion is made to our article on the Orthoscopic Lens, in No. 40. Writing to us he says,—

"Professor Petzval, in his letter, thanks you for the 'well-done popular representation of the working mode of his new lens,'" and adds,—"'such popular explanations, important as they are, sometimes escape the inventor himself, when turning up the ground of mathematics, searching for integrals, &c.' He appreciates these explanations the more, as he is himself going to do something for the better understanding of several notions in Optics, and will bring it in his new work on Optics."

In the last number of Mr. Snelling's American Photographic Art Journal there is a pretty print on plain paper, produced by the following formula, which is a modification of that described in No. 50 of this Journal:—

SALTING SOLUTION.

Chloride of Ammonium............180 grs.
Filtered Water...................... 1 gal.

NITRATE SOLUTION.

The ammonio-nitrate of silver, made as before directed in *Notes*, No. 50.

TONING AND FIXING BATH.

Chloride of Silver	480 grs.
Acetate of Lead	560 "
Chloride of Sodium	600 "
Filtered Water	½ gal.
Hypo Soda, to saturation.	

First dissolve the acetate and add the sodium; next the hypo-sulphite of soda until the precipitate, which forms on the addition of the sodium, is dissolved and the solution is clear; then add the chloride of silver, and after its solution, put in hypo as long as taken up by the liquid, and filter. No precipitate should be suffered to remain in the bath; but should be filtered out daily, as it otherwise spots the picture in the washing-trough. After filtering for the first time, if the immersion of the first print turns the solution milky, it is because there is not sufficient hypo and more must be added. The picture must be printed quite strong.

We cannot perceive the use of the chloride of silver in the above toning bath. Our readers should try the process, and compare it with that in No. 50. Both formulæ give beautiful prints. Blanquart Evrard was the first who added acetate of lead to the hypo bath. The purple tint is probably produced by a partial substitution of lead for silver in the print. It has not the cold, inky effect of gold toning.

Mr. Snelling has reported the controversy we had with Mr. Malone some time back about the fading of positives, and he winds up with the following amusing remark:—(page 95, No. 3);—" Mr. Sutton lays down the law to Mr. Malone quite effectually. He has decidedly the advantage. Mr. Malone, it seems, is like the boy who declared he never would go into the water until he had learned to swim. We have a number like him on this side of the Atlantic." Mr. Malone, among other sage remarks, objected to our idea that sulphate of lime existing in the paper might assist the fading of a print. In a lecture delivered a short time ago by Dr. Lankester, at the Royal Institution, he observed that organic matter decomposes sulphate of lime and liberates sulphuretted hydrogen;—a fact well known to chemists.

The number from which we take the above formulæ for printing contains a very tolerable portrait, printed by a process of photo-lithography, lately patented in America by Messrs. Cutting and Bradford, and probably very much like that of M. Poitevin. There is a class of subjects which would suit this process exactly, even in its present imperfect state;—we mean bold bits of detail for artists and drawing-masters, the merit of which depends on boldness of effect rather than on delicacy of treatment. For portraits it is certainly at present much too coarse.

Printer's ink appears to make a capital substitute for the common black varnish for positives. When dry upon a plate, it is extremely tough and difficult to scratch, and not brittle, like black varnish. In brilliancy of blackness and glaze nothing can surpass it. What the effect of time may be upon a plate varnished in this way we cannot yet say, our experiments being quite recent, but we think the suggestion likely to prove valuable. Printer's ink is cheap enough, and can be obtained anywhere. To apply it, rub it over the plate with the tip of the finger; rub some also upon a piece of paper, then apply the blackened side of the paper to the blackened plate, and press it into contact. The picture is now ready to be put into the case. The ink gets dry in a day or two, and when dry looks as brilliant as when wet.

Printer's ink is made by grinding lamp-black, with a little indigo added, in printer's varnish, which is composed of boiled linseed oil, resin, and yellow soap. This varnish can be purchased separately, and the ink may be thinned with it to any extent. The nature of the ingredients render it pretty certain that printing ink will not crack, but experience must decide the matter.

We have often been asked how to make spirit varnish for negatives. The following is an extremely simple plan:—

Procure some French polish, (which is shellac dissolved in methylated spirit), and dilute it with about an equal quantity of methylated spirit, or alcohol. Then warm it until the solution becomes clear and free from muddiness. This is perhaps best done in a tin pot, with a lid, over a common fire. Varnish made in this way does not cost more than about 2s. per pint. The best spirit varnish is nothing more than shellac dissolved in alcohol.

A correspondent has suggested that our articles are "too heavy and scientific," and that we do not give enough "useful dodges." Here, then, are some "dodges"; let them go for what they are worth. If "dodges" are what is required we will endeavour to fill a page with them in every number, and our Journal may be called "Photographic Notes and Dodges."

The Photographic Dictionary will be published about the end of the month.

A New Photographic Society has just been formed at Macclesfield. The following is the list of officers:—

President.
J. BROCKLEHURST, Esq., M.P.

Vice-President.
G. STEWART, Esq.

Treasurer.	**Honorary Secretary.**
Mr C. R. JESPER.	Mr. F. M. MERCER.

Members of Council.
Mr. W. FODEN. Mr. J. B. ROBINSON. Mr. T. SHARPE
Mr. W. THORNYCROFT. Mr. T. S. WRIGHT

The Secretary of the Society has done us the honour to ask us to prepare a paper for one of their Meetings. To this we have gladly consented. The subject will be—"Suggestions for various Impovements in the construction of Cameras and Mountings of Lenses." The paper will be illustrated with diagrams, and if the Society think it worth reading at a meeting, we shall report it in this Journal, and introduce the necessary woodcuts.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, April 16th, 1858.

The President, (M. Regnault), read a letter from Herr Pretsch on the subject of his process of Photo-galvanography. With the letter were enclosed several matrices and copper plates produced by the process,—some touched, and others untouched by the engraver, together with proofs from the same. In this letter Herr Pretsch makes some remarks with respect to M. Renaud Saillard's process, and observes that his process in which the bi-chromate of potass and gelatine is employed, was patented in England in November 1854, and in France in June 1855, while the patent of M. Poitevin for a similar application of the above substances bears date August 26, 1855.

M. Henri Corbin exhibited a number of positive prints from the collodionized-paper negatives exhibited by him at a previous meeting.

Some photographs of the Solar Eclipse of March 15th, taken by M. Desionges, and others by Messrs. Porro and Quinet were exhibited.

M.M. Davanne and Girard presented the continuation of their paper entitled "A general investigation of the printing of positive photographs."

This communication is extremely instructive and important, but as it occupies more than 13 pages of the Bulletin, we must defer the insertion of an abstract of it for the present.

[Ed. P. N.]

M. Maugey, Optician, exhibited a diaphragm with a variable aperture, which can be adapted to ordinary lenses. The principle is as follows:—A thin disc of india-rubber, perforated with a circular hole of the smallest diameter intended to be used, is fitted to the inside of the lens tube, the edge of the disc being rigidly fastened all round to the tube. A copper cylinder fitting the tube internally, and capable of being moved along it by means of an external screw, presses against the india-rubber elastic disc, and according as this pressure is increased or diminished so the circular hole, or diaphragm, is, by the elasticity of the material, proportionably increased or diminished in diameter. The aperture of this variable diaphragm can be altered while the picture is being taken.

It is very amusing to us to find so many supposed new inventions continually turning up which have been already described in this Journal. The diaphragm of M. Maugey, for instance, was suggested by Mr. Taylor, of Dumfries, in his paper in the "Photographer", reported in *Notes*, No. 24, page 121. It is evident that the moveable copper tube alters the *place* of the diaphragm with every change in its diameter, but in a *good* portrait lens, this does not lead to any practical inconvenience. [Ed. P. N.]

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

General Meeting, April 27th, 1858.

The Vice-President, W. Howell, Esq., in the Chair.

The minutes of the last Meeting having been read and passed, the following gentlemen were elected members of the Society:—Mr. Edwin Ball and Mr. Alfred Hunt.

The Chairman then called upon the Rev. Wm. Law, of Marston Rectory, to read his Paper, entitled:—

A FEW STRAY NOTES FROM MEMORANDA OF PHOTOGRAPHIC DIFFICULTIES.

The reverend gentleman then rose, and read as follows:—

The compliment which your Society has paid me in electing me one of your Honorary members, demands the expression of my gratitude and I am happy (in complying with your request that I should read a paper this evening) of the opportunity of blending my thankful acknowledgements, with my contribution, however small, to the interesting subjects which have already occupied your attention.

You will have been prepared by the title of my paper, not to expect a dissertation on the history, the importance, the applications, and progress of this most fascinating branch of science. It is my province to handle a few hard physical facts. My remarks will be entirely of a practical nature, and necessarily cursory. "Photographic difficulties" embrace topics of a wide range; and the very perplexities to which they give rise, must inevitably present attraction to a philosophic mind, and redouble the energy of expressiveness and enquiry. We meet together on occasions like the present, to compare notes,—to engage in discussion,—to ask questions,—but seldom, I fear, to do, what is probably of still greater importance, to report and exhibit *failures* and difficulties. It is offensive to to the *amour propre*,—it wounds the pride of human intellect, not to master what others have done, and any confession which may seem to involve a lack of skill or of knowledge, is seldom heard at meetings like this. And yet if we carefully scan the burden of editorial replies to correspondents in our

photographic journals, whilst we smile in guessing the absurdity of the enquiries of some, we can, few of us, I fancy do other than sympathise with the plaints and perplexities of others. A hospital for forlorn photographers, would, barring the hindrance already alluded to, seldom want occupants, and, under the judicious care of such doctors as Birmingham affords, I conceive that the proportion of incurables would be very small indeed. But I am not here to excite your sympathy to the extent of such a testimonial as this, although in sober earnestness, the principle on which it would rest has often been broached. What we really want is a committee composed of a very limited number, say 12 gentlemen, of sound scientific acquirements and chemical knowledge, and skilful in photographic manipulation, who should test by actual and varied experiments the comparative value of the several processes, combinations and suggestions, continually brought before the public. I confess I do not feel the force of the objection that has been urged against the erection of such a valuable authority as this. Undoubtedly their report would give umbrage to some, its very faithfulness must offend, for never, &c.,—but the offence would soon be forgotten, the spleen of disappointment would soon evaporate in harmless ebulition, and the benefit to photographers would be great and lasting. If honey and treacle, gelatine and meta-gelatine, deliquescent salts and collodio-albumen, cannot be all bracketed together as first class "œquates,"—surely their propounders cannot deem their efforts unappreciated, if the examiners by whom the qualities of these processes have been tested, do not place them all under the same standard of perfection. Before such a tribunal as this, mere surprises would soon find their proper level, and the wide-spread disappointment occasioned by the publication of unsound formulæ would at once be ended, and needless trouble and expense be spared. Perhaps, as a stranger among you, I may be thought somewhat presumptuous in expressing my sentiments thus freely, but I entertain a very strong opinion on this subject, and only hope that my feeble advocacy of the appointment of such a committee may find an echo in all the other photographic societies of our country. The subject of "photographic difficulties", now so painfully prolific, would then soon cease to be so; and although the fact of our researches being directed to the mysterious essences of actinism, heat, electricity, molecular changes, and delicately-balanced chemical affinities,—although this would necessarily keep us fully alive to our own ignorance, and prompt us to new and unceasing enquiries and experiments, our progress would not then be as now, retarded by falsely-assumed facts, or by the imbibition of theories which may soon be exploded and forgotten. But time bids me to extend no further these preparatory remarks, although I cannot regard them as digressive, but simply and naturally introductory.

With a subject necessarily so varied and comprehensive as Photographic Difficulties, it seems no easy matter to select and elucidate. On one point, however, we must all be agreed, that the choice of a process either for portraiture or landscape work where we have conveniently at hand the appliances of a dark operating room, presents no possible difficulty. Moist collodion achieves all that we require, and far better and more rapidly,—whether we adopt either the direct positive or negative process, than any other known medium on which the actinic rays can act. The chief desideratum now is a dry process, possessing, or even approaching the characteristic qualities of the superlative excellence of this. Whether any dry film will ever be discovered in which the atoms of iodide of silver are loosely imprisoned and yet so completely entangled, so united and yet so ready to be disturbed by the momentary passage of the slightest gleam of light, as in moist collodion, seems to me extremely problematical. But it is encouraging to know, that to many photographers of skill and science the discovery of such a process which our science, has made since the period when Daguerre announced to the French Academy, that, with a 20 minutes sitting in the bright glare of full sunshine, he could impress upon his silver tablet the likeness of the human face divine, certainly induces the hope that a dry process for outstripping all previous ones in rapidity, may yet be in store for us. And I am happy to be able to add, that in a letter I have recently received from Dr. Hill Norris, he mentions that his researches and experiments are directed to this achievement, and that he is not without a hope, verging upon certainty, that he shall ere long accomplish this desideratum. Most cordially must every amateur who can appreciate the aid already rendered by the worthy Doctor to this branch of science, wish him, as I beg to be allowed to do, success. And here let me, so far as my own experience enables me, dispose of one difficulty, viz., that of selecting a really workable and certain dry process. Time forbids that I should even essay to mention half of the processes that contend in generous rivalry for the palm of victory in the pages of our various Journals. Let me assure my audience that in giving my own individual preference to some, I must not be understood as speaking to the disparagement of others. I have at different times, as leisure has been afforded me, experimented with almost all; and in every instance in which the *rationale* of the process seemed to rest on a philosophical and sound basis, I have succeeded in obtaining, so far as the mere production of a picture was concerned, satisfactory results, but a comparison even of the best, with moist collodion, sadly qualifies one's praise. Of all the *moist preservative* processes, undoubtedly Mr. Shadbolt's Honey process, with Dr. Mansell's modifications, is the most rapid and unfailing, but plates kept long, especially with free nitrate left on the film, are apt to show a troublesome marbled appearance during development, which not unfrequently produces stains. Mr. Llewyllyn's original process does not present this difficulty, but its comparative slowness in receiving the actinic impression is an objection, which its superior keeping powers do not, I think, counterbalance.

The liability to contract dust in these processes, as well as well as in that of treacle is also a serious drawback to their general use, and both honey and treacle, from their peculiar and permanent stickiness, are extremely unpleasant to use. The meta-gelatine processes of Mr. Maxwell Lyte and Mr. Long, are capable of yielding most excellent results, but there is the trouble of boiling and reboiling, with the risk of discolouration from the injudicious application of heat in dissolving the gelatine, and in the former the additional tediousness of neutralizing and filtering the solution. The free nitrate in neither of these processes is recommended to be washed off, which I cannot help concluding, from a lengthened series of experiments, renders the plates exceedingly liable to stains.

If I have not previously mentioned the gelatine process of Dr. Hill Norris, it is not because I can

for a moment hesitate to assign to him the honour of having been the first to recommend this most valuable agent for penetrating the pores of the collodion film, and for imparting to it, when dry, a hard and even surface. Nor must I omit to notice (it would be manifestly unfair to do so,) the interesting and conclusive report of the Doctor's experiments, having for their object the discovery of a collodion with the requisite qualities for his purpose, permeability to the dissolved gelatine, and firm adhesion to the surface of the glass. From my own recent experiments with some of these plates, I can most fully confirm all that has been said respecting their certainty, if only the slightest knowledge of photographic manipulation be combined with ordinary care; and most conscientiously do I recommend them. The difficulty of selection seems to be between this process and that of Taupenot.

The results are equal;—but I found on exposing at the same time, and in two cameras, mounted with lenses of precisely the same focus and action, plates prepared by each process, that the latter was a trifle superior in sensitiveness, but it is right to add that I did not in developing follow the Doctor's directions, having used simple gallo-nitrate for both. The dry collodion plate however was fully developed in half the time required by the collodio-albumen. And here let me direct your attention for a few minutes to a very valuable communication I received yesterday from Mr. A. Keene, of Leamington, to whom I addressed an enquiry respecting a new dry process, said to be of surpassing sensibility, by Mr. Fothergill, and alluded to, but not described in the London Photographic Journal, of the 22nd inst:—

" *To the Rev. William Law, Marston Rectory.*

" Rev. Sir,—I must apologise for not answering your communication yesterday, but press of business prevented. I presume you to be well acquainted with the different dry processes of which the collodio-albumen has, I think, been generally acknowledged the most satisfactory: but the numerous precautions and the time required in preparing plates, with the liability to blister and tediousness of developing, have been serious objections. Mr. Fothergill, the discoverer of this process, a gentleman frequently visiting the Revd. Mr. Prior, South Bank, is an ardent photographist, and has previously been trying a series of experiments to find, if possible, a preservative and accelerating substance which would answer the purpose, when simply poured on the washed sensitized collodion-plate, washed off again, and dried, in fact to simplify the process to a minimum. Among other things likely and unlikely, he tried albumen, which has been found fully to do so, accelerating the sensitiveness double, compared with collodio-albumen, and by some thought nearly, if not quite as sensitive as wet collodion.

" The plan that has been found to answer best is:

" Sensitize the collodion plate in usual way, in a thirty-grain *neutral* silver bath, wash moderately well with water from jug or bottle, not under a tap, until greasiness disappears, drain a second or two, and pour upon it sufficient prepared albumen:

White of Egg,.... 10 drachms.
Distilled water.... 6 do.

" Strong liquor ammonia 6 minims. Agitate into a froth and filter through sponge. To coat the plate run this round and round for about half a minute, wash as before, place on end on three or four thicknesses of blotting paper in chemically dark place to dry—ready for use in six or eight hours. Develop with this solution:—

Pyro-gallic acid... 2 grains.
Glacial acid.......10 or 15 minims.
Distilled water.... 1 oz.

With *three* or *four* drops of bath to each drachm. In very warm weather equal parts of this and following developer produces a clean picture, with same quantity of bath to each drachm:—

Gallic acid powder.. 1 drachm.
Pyro-gallic......... 10 grs.
Glacial acid......... $\frac{1}{2}$ drachm
Distilled water...... 20 oz.

" Let it stand an hour or two, frequently shaking and filter; the picture is developed in from five minutes to fifteen, fix with hypo; if with saturated solution, only let the plate remain in about half a minute, or film will crack and curl up when dry. About four ounces hypo to twelve of water is better. You will perceive no new agent is used, though the result from the means could not have been anticipated, and I think opens a wide field for speculation and research. In what manner the albumen acts, whether sufficient free nitrate is retained in the pores of the collodion film, for an albuminate of silver to be formed, which being insoluble does not wash off, or whether albumen acts merely mechanically, preventing the contraction of collodion film when dry,—the first idea appears most plausible, but against it hard water, containing chlorides, is found to answer. I have also succeeded in obtaining a picture, though certainly a faint one, upon a plate which has soaked a quarter of an hour in a weak solution of iodide of potassium, after being washed before albumen was poured on—that the albumen does produce the effect is evident, as plates prepared in some manner without albumen, and with albumen, without being washed, give but a weak picture after a much longer exposure. A portion of the albumen is also retained, the film on the plates prepared by Mr. Fothergill's process is quite firm, but on those developed without any albumen previously poured on, rotten. Mr. Pritchard, Surgeon, of Westbrook House, has been very successful with this process; he obtained yesterday a stereoscopic picture—plate four days old—negative in twenty-five seconds, a 10×9 negative, at 30 past 4, in a minute and at half; he was at the same time trying experiments in the same direction as Mr. Fothergill, and would no doubt have discovered it, had Mr. Fothergill not been first.

" Since commencing this letter I have also had a gentleman who resides in the neighbourhood, bring me a negative to see, taken this morning at ten; two and a half minutes exposure in a greenhouse; very dense, and rather overdone.

" I have contented myself with briefly as possible stating above facts which I hope may prove serviceable. I have no doubt of the process superseding all other dry processes at present known, from its simplicity and sensitiveness. I shall be happy to give you any further information in my power.

" Respectfully yours,
" A. Keene.

" Leamington, April 24, 1858."

Mr. Law suggested that the absorption of albumen into the pores of the collodion might possibly be due to the antagonistic currents of endosmose and exosmose, which would undoubtedly be excited when the albumen was poured on the film. The effect of the latter current would be to carry, *only in a much smaller proportion*, the solution of albumen into the pores of the collodion which, by endosmose, had been deprived of a portion of the imbibed argentine solution. The albumen became thus imprisoned, and blending with the moist

collodion film throughout its substance, would not be dissolved out by the moderate washing which completes this process. He suggested, on this principle, the following experiment, as opening a subject for interesting and important scientific investigation:—

Coat a clean glass plate with a filtered solution of gum-arabic—let it dry,—collodionize and sensitize in the usual way. In this case the stronger of the two currents, *endosmose*, would be brought into play; the pores of the collodion would be speedily filled with the gummy liquid, and the plate then simply washed and dried, might possibly yield a a film which, even in that condition, would be readily permeable by the developing solution. This Mr. Law observed would be only carrying out to its final result, the use of the albumen basis, recommended by him in the Journal of the London Photographic Society for October 1854, pp. 46—7.

But, as I have said before, the selection of a dry process seems to alternate between Dr. Hill Norris's and Taupenot's. The great objection to these processes is the risk and trouble of carrying about a great weight of glass. The various paper processes overcome this difficulty; but there is the granulation, which is almost always present more or less, and the inferior keeping power, to counterbalance the disadvantage of glass. I therefore feel inclined to yield the palm to Dr. Norris's process, which, for simplicity and absolute certainty, with anything like ordinary care is, I think, unsurpassed.

Among paper processes my favourite one is as you are aware the Wax Paper, and next to that, is the simple Calotype. Turner's paper, immersed in a solution of 200 grains Iodide Potassium, 100 grains Bromide Potassium, 1 pint water. Excited on the same bath as for Wax Paper, and exposed while damp. I have taken very good portraits by this method, not of course equal to collodion.

[A number of prints were here handed round.]

A great portion of these prints are, by the process I have just mentioned,—some by Wax Paper, and others by Collodion. Many of the large ones are printed in a new way, which I shall presently describe.

We shall now come to the consideration of a few of the "Difficulties of Photographic Practice."

First then,—Coating glass plates with collodion. To do this successfully some kind of holder should be used, and I know of none better for small plates than the one I now show you. A strong vulcanized India-rubber ball, attached to a disc of gutta-percha, faced with India-rubber; this may be purchased in most of the shops.

For large plates, rather a different one is required. The one I use is a plain turned-wood handle, hollowed at one end, and three little wedge-shape bits of gutta-percha let in; these, when warmed, will adhere firmly for hours to the largest plate, and require some force to detach them.

[The instrument, very simple and ingenious, was handed around.]

Another difficulty is in *evenly* developing dry plates. When held in the hand, even experienced operators find a difficulty in getting the solutions well over the plate. To obviate this I take a piece of glass, somewhat larger than the plates intended to be developed, and I cement, with marine glue, strips of glass round the edges, so as to make a dish at once very useful and easily cleaned, which, at the same time being transparent, the progress of the development is easily seen. You may see how easily they are made. I may here just mention how exceedingly useful to photographers is the article of marine-glue. I am very fond of it, and invaribly use it whenever I want a cement.

Filtering albumen for Taupenot's plates is our next difficulty. I have a small apparatus here, a modification of Mr. Crooke's albumen filter. You will see the principle upon which it is made, that all liquids will force themselves to a level in different vessels, providing there is any communication, however small.

Another difficulty is the frothing of albumen and water. This little instrument has frothed some gallons of albumen since it has been in use. This apparatus consists of a small bottle with a wide neck; through the cork is passed a piece of wood about the thickness of a cedar pencil, into this six or eight small pegs of wood are fastened. The shaking of the bottle then quickly froths the albumen.

Plate-cleaning (both old and new plates), presents another difficulty. I have contrived this little affair for that purpose; you will see it consists of a slab of wood, with a handle (like the back of a hair-brush;) round the edges are cemented bits of glass; the plate to be cleaned is then slipped in its place and secured by the sliding bolt of glass, thus this enables you to hold the plate firmly in its place while rubbed with a tuft of cotton wool, dipped in nitric acid; for this suggestion (the use of nitric acid) I am indebted to Mr. Sutton, and I can confidently recommend it as the best possible detergent. I apply it with a Buckle's brush; only using a gutta-percha instead of a silver hook.

[Mr. Law then exhibited a very ingenious frame for printing from stereoscopic negatives; also two or three very nice frames for drying plates.]

I shall now proceed to exhibit my apparatus for taking dry plate stereoscopic pictures. The mahogany box you see before you (size about 15×8×6), contains a yellow glass window, back and front, and two sleeves. Inside are two stereoscopic cameras, (single); these fit on to suitable fastenings on the top of the box, and these fastenings have two motions, convergent and extending. There is also a box inside containing 36 prepared plates; the plates in the slides are changed by inserting the hands through the sleeves. The whole is very light and portable.

I am very fond of taking forest scenery, and have frequently noticed a very peculiar effect with some of the plates—a peculiar smudginess on the faces of some of the trees, especially larches and other trees of that class; after some time I discovered that this was caused by the travelling of the light partially across the stems, during the 2½ or 3 minutes of exposure.

And now I have a few words about Dry Collodion practice. With most of the really good ones I have been very successful. Of the Preserved Processes I like Shadbolt's Honey Process the best, but there is considerable difficulty in removing any spots of honey from the hands. Of those which are *dry* I like Taupenot's and Dr. Hill Norris's; to the latter gentleman is undoubtedly due the credit of being the first to suggest and perfect a really *simple*, *efficacious*, and *certain* dry process. I have no personal feeling whatever in speaking so favourably of the Doctor's process; I only speak in what I feel to be strict adherence to the truth. Long's process is merely a copy, and a very poor one, of the one just spoken of.

I should like now to introduce a little instrument for spreading the ammonia-nitrate solution evenly. It is a small glass pipette, with a very fine aperture,

and a piece of India-rubber tubing at the other end, one end of which is closed; it acts exactly like a syringe; a few drops of solution are squeezed on the paper and brushed over, and this is repeated until the paper is well covered. The usual plans of brushing or spreading with a glass rod are ineffectual.

The last difficulty I shall bring before your notice is the roughing the edges of the glass plates. In some conditions of collodion it will slip off the glass, and you cannot possibly avoid it, except by roughing or grinding the edges; this I accomplish by means of a piece of whetstone, cemented to a bit of glass, and by this means I am enabled quickly to grind the edges of any plate.

In conclusion, let me thank you for the attention you have paid, and the welcome you have given to me this evening. I feel honoured by your kindness in electing me as an Honorary member of your Society, and shall always do everything in my power to assist you in your laudable endeavours to advance our fascinating art. (Cheers.)

After some discussion, a vote of thanks was given to Mr. Law for his kindness in coming such a distance to read such an interesting paper, and for exhibiting such a variety of useful and novel apparatus, together with the beautiful negatives and prints illustrative of the processes.

Mr. Morris then exhibited a Solar Camera, kindly lent by Mr. Atkinson, of Liverpool. This instrument consists of an oblong box, about 18 inches long, mounted at one end with a large condensing lens, into which the light is thrown by a moveable mirror, exactly as in a Solar Microscope; a sliding frame to hold the negative occupies the centre; and at the other end, is a hole to receive the nozel of a half-plate lens, the image being thrown on a screen at some distance. He also exhibited a new apparatus for taking Vignette Portraits, and also some portraits produced by its means. This was the invention of Mr. Atkinson. He also exhibited an Orthoscopic Lens.

After the thanks of the Meeting had been given to Mr. Morris, it was announced, that at the next Meeting, which will be the last of the present session, Mr. Bourne will read a paper upon "Photography, as applied to the Purposes of Trade."

At this meeting also, the first free distribution among the members, of pictures purchased by the Council, will take place.

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEARS 1856-7.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Continued from No.* 51.]

As panteth the hart for the water-brooks so does the ardent photographer long to be "up and doing" with the occurence of these few deliciously, bright, fresh, and healthgiving days which often occur in early Spring; but here, theory, as in other affairs of life, proves vastly more fascinating than practice, for they are not the days to commence the "gentle art" and the "longing lover" had better delay and curb his ardent aspiration, taking to himself for consolation that "discretion is assuredly the better part of valour." The sun has but little power, and the pictures produced share it from their fullness and want of force and brilliancy.

Family matters compelled me to break up my winter quarters earlier than I could have desired, and early in April of last year, (1857). I found myself wending Northwards and finally safely deposited in "auld Reekie," enveloped, as I entered, in as genuine a Scotch mist as I can remember, and all looking comfortless and giving anything but a warm welcome to the Southerner; day by day slipped away in the hopeless expectation of bright weather assuming. Easterly winds, mist, snow, rain, and hail were the order of the day; the camera, of course, never was unpacked, and the heart was sick with hope deferred; at last, however, a bright gleam of real sunshine began to show itself, and eager for the fray, at the end of April, I started by railway for Melrose, making this the starting point for what I would term an *Abbotsford Pilgrimage*, and one as well worth making as any, to Compestell, and if with camera and a fair share of success the traveller will not regret the trip. At Melrose most comfortable quarters are to be met with, either in the Inn, which is very good, or in lodgings, which are abundant. Of the Abbey, perhaps the finest scene in Scotland, I need scarce descant much. It has been praised and described in much more graphic language than I can boast of using; it has been painted by thousands on canvas, and yet neither verbal description or the cleverest limner on canvas, can I think, sufficiently do justice to its various beauties. Its location too, and accessories, are so truly beautiful. Waving away the garrulous old Custode and turning a very deaf ear to his oft-told tale, I began to frame in my own mind the several pictures I purposed taking; and I think, if I had rested there for weeks, instead of days, I could each hour have found out some fresh and undiscovered beauty. Summer, bright, fine, sunny weather, is however, certainly the right time to see this scene in perfection, and not at the early period of the year when I saw it. It is well cared for too and most carefully preserved, as it richly deserves, and in its declining years propped up and supported when weak, and every attention paid to it to keep it as much as possible from falling under the ruthless hand of the destroyer Time. Several very beautiful views are easily attainable in the interior of the building, the light being very good, and some of the details of the tracery of the windows and the graining of the arches worth any pains being taken to ensure success; of the exterior every facility is obtainable for view-taking in the church-yard, and what is no small luxury to the photographer, absolute quiet, the church-yard being securely railed in, thus preventing the *small-fry* that generally buzz around the operator, from penetrating. I spent two delightful days, bringing away eight negatives. From here to Abbotsford is only an easy drive. Shall I own to a feeling of disappointment which I felt on first seeing this world-known house. I had expected much more from the situation. The hills, as all the Scotch hills are to my mind, wanting in verdure, and the fields wanting their hedgerows, presents the same *un*-picturesque expanse of

verdure that one sees through France and other parts of the Continent; wanting in fact, the very essence of a beautiful landscape, the hedgerows and tree-covered hills and glades of old England. The house too, I was disappointed with, externally and internally; although in the various rooms are crowded objects of great interest, still I seem to have expected more. I was not allowed to take any view of the front of the house; but from the terrace behind, I readily obtained two that quite repaid me the trouble of the visit. The house, an irregular and not unpicturesque pile of modern building, photographs very well, the stone being a dark grey, and doubtless had I had more time, from the opposite bank of the river several very beautiful views would be obtainable. From Melrose a few hours takes the tourist to Kelso, a most picturesque town, beautifully situated by the side of a fine clear river, spanned by a noble bridge, and close to the town, the majestic ruins of the Abbey. A general view of these fine and extensive ruins is readily obtainable from the church-yard which surrounds it, and amply repays the photographer. There is very much to be done here and all is easily accomplished from its peculiar locality, not being closed in by buildings; but, as is the case with nearly all these ecclesiastical ruins in Scotland, the surrounding ground is appropriated to the purpose of a burying-place; thus answering the double pupose of a resting-place for the dead and a security also for the ruin that it surrounds. Crossing the river Tweed is seen the fine gothic seat of the Duke of Roxbury, Fleur's Castle, a fine and extensive pile of buildings; but I came for the Abbey, and was content with getting several, six, good negatives of it.

The great advantage of this agreeable little tour is the facility with which each place is reached by the railway and the comfortable and moderate priced Inns that are to be met with in the various towns; for eager as the artist is for his mental food during the day the comforts of a good Inn and well-dressed dinner are by no means to be despised; or the clean, wholesome, fresh-smelling sheets at night, whereon to rest the weary body, and dream of coming enjoyments. Near Kelso is a hill called the Pinnacle Hill, quite worth the trouble of ascending, and giving the visitor an excellent idea of the singular beauty of the situation of this pretty town. Having obtained what we thought a fair number of views we journeyed on next to Dryburgh, the ruins of Dryburgh Abbey being about a mile's walk from the station; this, to my mind, was the most picturesque fragment of a ruin that I had yet visited, irrespective of the interest attaching to it from its being the resting place of the remains of the great Unknown, a curious fancy to be thus buried, nor is the tomb, or tombstones, with the modern iron railing, at all in keeping with the venerable building that enshrines it. He lies buried in St. Mary's aisle, with his wife and son. The beautiful foliage of the trees enlivening these ruins particularly struck me—a beauty that most of the Scotch ruins are sadly wanting in. The ivy here twines its tendrils to great advantage, adding, if possible, fresh beauties to the Witches Wheel window, that must ever be admired and gaped at with delight. Here is truly a rich field for the photographer. Fear not to over-expose, for the large masses of green, and the dark colour of the stone will admit of nearly any length of time.

Jedburgh and Dryburgh can comfortably be accomplished in the same day, and still allow ample time for all necessary work. The Abbey at Dryburgh, if nothing else were visited, is worth all the trouble of the ride from Edinburgh. Jedburgh is somewhat more difficult of access, I mean as to the finding a good point of view from which to take the extensive ruins; one is obtainable from close to the gate of the church-yard, and another from the road, but both are somewhat too close. The interior did not seem to me to present many points of interest. It is a most venerable pile, of the date of 1,000, rebuilt by David I. Part of it has been roofed in and glazed in the worst possible taste, and is now used as a place of worship. Sir David Brewster and Mr. Somerville first drew breath in this little town. I contented myself with two views of the Abbey, and not liking my quarters, the Hanar (the Spread Eagle evidently being the Inn of the place), I determined on taking the late train to Edinburgh, thus closing a week's most enjoyable and instructive tour; moderate in expense, most easily accomplished, and possessing many and great points of interest, whether to the ordinary traveller in search of the picturesque, or to the primary and more searching eye of the photographer, who seems never satisfied, not even with walking away with Abbeys in his portmanteau, and bridges, rivers, ruins and palaces, under his arm,—he still craves for more.

To be concluded in our next.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ON THE TREATMENT OF OLD NITRATE BATHS.

To the Editor of Photographic Notes.

SIR,—In August, 1857, after six months of absence, I found my sensitizing bath of a deep brown colour. I tried kaolin and filtering, *but in vain.* I put it by as useless, (say about 40 ozs. and call this *bath A*). I then converted an old nitrate bath which had been used for over twelve months, into a sensitizing bath (say 40 or 50 ozs.). I used it continually for about five months, cleansing it from time to time with kaolin (call this *bath B*). As this bath had originally been only a 30-grain bath (reduced by the iodide of potassium, when mixing it), it must have been very weak.

Having used a large portion of this bath, I mixed the discoloured bath A with the remains of it, and used kaolin: the result was a PERFECTLY CLEAR BATH, which acted well, (call this mixed bath, *C*). I took about 14 ozs. of C, and added to it 6 ozs. of a 5-grain solution of nitrate of silver. Supposing C not to contain more than 18 grs. of nitrate per oz., this new bath, (D), would contain under 26 grains per ounce. I divided a sheet of Sandford's albumenized paper into two parts

I albumenized one in bath C and the other in bath D; the same time was given to both, they were dried together; a slip of each portion was placed on the same plate; they were exposed for the same length of time and toned together. This was repeated.

I send you the results. It would not be easy to distinguish which had been floated on the stronger solution; which on the weaker.

I began these experiments with a bath which had been discoloured (I know not how), and which had been laid by for over a year. I forget the number of your journal in which I mentioned this. I drew the conclusion that time is, to a certain extent, an equivalent for strength, in nitrate of silver in sensitizing. I believe that I am right.

I now find that a discoloured nitrate bath, tho' at first *incurable by kaolin*, if put aside for some months, and then cleansed by kaolin, may be made a most effective sensitive bath. I do not attempt to account for the chemical changes which must have taken place. All I know is that a bath which *kaolin* failed to cleanse, was, after lying by for five months, perfectly cleansed by *kaolin*. Nor was the cleansing the result of mixture with the old clean bath; for before mixing the two solutions, I tried a small portion of A with kaolin, and only when the liquid became clear did I mix the two baths A and B together. "N."

P.S.—Perhaps I ought to add that the colour of the solution A remained unaltered until the last use of the kaolin.

— The strips sent by our correspondent are precisely similar in appearance, and the whites are beautifully preserved. The paper is certainly very good, and appears to be of English make. This may have something to do with it. "N." should procure one of Mr. Wood's Argentometers, and test his bath accurately. His results would then have more scientific interest. [Ed. P. N.]

MR. FOTHERGILL'S PROCESS.

To the Editor of Photographic Notes.

Dear Sir,—Allow me to bear my testimony in favour of the Dry Collodion Process, published in the *Times*, by Mr. Fothergill. It seems to me in point of sensitiveness to hold a middle place between Collodio-Albumen and Norris's gelatine, but I have not myself obtained, by any dry process, such soft and pleasing pictures as by this of Mr. Fothergill's. The plates so prepared develop beautifully under gallic acid and acetate of lead, as recommended lately in your *Notes*. I strengthen the picture sometimes with pyro-gallic and citric acid when the details are well out. I for one feel much obliged to Mr. Fothergill. As to collodio-albumen I find Mr. Acland's suggestion of washing the collodion film in a weak solution of iodide potass a very great improvement, the plates that have been so treated seem to develop with much more certainty, and the shadows are clearer than in all most any of the pictures that I have taken before without the said wash. From several experiments I should say that the latter process was from six to eight times more sensitive than Long's process. J. W. Bull.

Harrow.

BLISTERING OF THE FILM, &c.

To the Editor of Photographic Notes.

Sir,—Seeing in the last number of the *Notes* many complaints of the collodion peeling off the plates in the "Dry Process," perhaps it will not be out of place to say a few words on the subject. I have tried several samples of Collodion but could never develop without the film peeling off more or less. The other day I prepared eight plates, three with a collodion sold expressly for the Dry Process, the rest with some old red collodion, all sorts mixed together, which I have had by me some time. With them I succeeded beautifully; they came out well without the least tendency to peel off. I could give them a good washing without disturbing the film in the least. The three prepared with dry collodion I could not develop; two peeled off before I could get them out of the first dish. I use nothing but the plate itself for stereoscope glasses. I place it very level on the stand, and pour over the developer; there is no fear of it running off if the plate is level; for larger plates I cement strips of plate glass on to a flat piece of glass, just allowing the plate I develop to go in easily. I can then see how it develops, which I could not do so well in a porcelain dish. "Maitland."

—When the *proper kind of collodion* is used, blistering of the film, peeling off the glass, &c, never happens. The pyroxyline should be made with rather weak and hot acids, and the collodion should contain the proper quantity of water. When these points are attended to all goes right, and the film adheres tightly to the glass. [Ed. P. N.]

MINUTE HOLES IN GLASS POSITIVES.

To the Editor of Photographic Notes.

Sir,—Since I have arrived here from the North I find that all my positives go into small minute holes. Last year, when here, they did the same. I consider that it is owing to the Lime in the water, as the silver tests show abundance of it in the water.

In your first volume I wrote you about the same thing, signed "Chemical". Since then I have been in several towns and always find, when Lime is in the water, that, in a week or less, the Pictures go into minute holes. I do not admire varnishing the Pictures, but I can find no other remedy.

Glasgow. "Chemical."

PRINTING BY DEVELOPMENT.

To the Editor of Photographic Notes.

Dear Sir,—I have been trying your new modification of the development process with lemon juice, but have met with indifferent success. I send you herewith two prints as specimens; one on Canson's Positive, and the other (the Church). on Hollingworth's thin paper. You will see that the former is very granular and terribly dirty, the view of the church is less so, but the sky-part had a strong tendency to discolour in the gallic acid, and I had to remove it before it appeared half dark enough; the development occupied perhaps fifteen or twenty minutes, and I may mention that both papers were similarly treated in every respect, viz., salted with chloride of sodium, 8 grs., and lemon juice, 2 drops,

to 1 oz. of water, excited with Buckle's brush. *Clean.* Silver, 40 grs., lemon juice, 4 drops, exposed five minutes to diffused light, which gave a faint impression, and developed with fresh gallic acid, the print forming a tray.

I think all these appear to be conditions which should give successful results, and cannot conceive the cause of failure, at least on the Hollingworth's paper, but apart from the dirty development, the colour which the process seems to yield is not desirable. Now when I tried the process the first time, directly after you published it in *Notes*, No. 15, I easily got fine deep blacks, but with this modification it seems difficult, if not impossible, as one print I took remained in the gallic acid upwards of three-quarters of an hour without passing the red tinge; another difficulty seems to be that they change colour in the hypo as a sun-print; this I did not observe to occur on those prepared with gelatine and chloride of barium.

Now a word on your recommendation of Buckle's brush; it is certainly a very desirable implement, as it saves a dirty dish, but is liable to leave various markings and isolated spots, which seem to say that the silver is not uniformly spread. Would a stronger nitrate bath or a double dose of the ordinary one, better obviate this. My time available for Photographic experiments being so very limited I prefer to impose these questions upon you. Your solution of them may probably benefit others as well as myself.

"Phos."

—It appears that our correspondent only brushed the paper over *once* with nitrate of silver; it should have been brushed over a second time, about five minutes after the first application. The paper was therefore insensitive, and did not contain sufficient free nitrate to complete the development to the black tone; hence arose all the evils complained of.

There are some difficulties in this process of printing without a toning-bath which should be clearly stated, and, as far as possible, understood. When these are mastered the process is an extremely good one.

In the first place, a good negative is an essential condition of success. There is no possibility of getting a fine print from a bad negative. The negative should be *sufficiently* dense, but not *too* dense, in the blacks, and the lights should be clear and free from all discolouration; the blacks should not be quite so dense as those of a sun-print.

The nitrate bath should be in good condition, and the gallic acid freshly made, and energetic in its action. The exposure should be correctly timed, and the development pushed as far as possible. The hypo not stronger than one part hypo to twenty parts water. All that is now required in the process is to find some substitute for hyposulphite of soda. [Ed. P. N.]

ON DEVELOPING WITH IRON.

We quote the following remarks from a letter from Mr. Beattie, of Leicester:—

"I have this day tried the development with proto-sulphate of iron, as mentioned in the last *Notes*, and find it succeeds well."

SPOTS ON COLLODION POSITIVES.

To the Editor of Photographic Notes.

My Dear Sir,—I beg to submit to your opinion the accompanying glass photograph; it is as you may observe partially covered with small black spots, resembling pin points; it is one of many that have turned so after remaining apparently free from defect for about two weeks. They then presented faint spots which for some days became deeper, and having reached the stage of the one I sent you, got no worse. I do not think the cause is in the collodion, as all sorts give the same defect: neither has the washing anything to do with it. I wash well; and in order to obviate the spotting, have soaked the plates in water for hours together, after being fixed, but all of no avail. I appeal to your scientific and practical knowledge to point out the cause of this, and by doing so you will confer another boon on an unfortunate

"Photographic Leopard."

—We have had many queries lately with respect to these spots on collodion positives. To us they are not familiar, and we can only offer conjectures as to their cause. Are they owing to sulphurous particles in the atmosphere of smoky towns, which stick to the varnish; or to the film perhaps, while being dried before the fire? Or are they owing to impurities in the washing water, or to undissolved particles in the developer, or nitrate bath, which stick to the film? We can only suggest to filter all the solutions carefully, even to the washing water; or to use distilled water for the final washing, and to dry and varnish the plate in a place free from smoke, and then to enclose it at once in the case.

[Ed. P. N.]

ON THE DEVELOPMENT OF NEGATIVES WITH IRON.

The following is the postcript of a letter received from a correspondent who has just returned from America:—

"I see people are experimenting with sulphate of iron as a developer. The following is a formula which a friend of mine in Montreal, Canada East, discovered, or whatever you may call it; and in taking portraits I have seen him take a negative likeness of a child in less than two seconds, which he could not attempt before at all, an ordinary pyro-gallic negative taking 40 to 45 seconds, and longer. He has used this since the beginning of February, I think.

Proto-sulphate of iron.........	2 ounces.
Acetic acid	..12 "
Water	.40 "

"Bring up the full detail with the iron developer, and finish with the usual pyro-developer and silver.

"The Artist whom I mention is Mr. Notman, of Montreal. The collodion was Anthony's, of New York. I cannot say how it is made exactly, but it is almost invariably good, the same answering for both negative and positive.

"I used this formula for Norris's dry plates with great success, (I speak as an amateur), in taking winter views, in Lower Canada, often 10° or 15° temperature, only I diluted to half the strength with water, and added a quarter-of-a-dram of glacial acetic acid to the ounce."

"*Enquirer*" finds a difficulty in getting good prints on albumenized paper. His tones are too red, and he wishes to obtain purples. The plan usually adopted is, to place the print, on removal from the pressure frame, in a bath of hypo-sulphite of soda to which chloride of gold has been added; to fix and tone it in this bath, and then wash and soak it for some hours in water frequently changed. The prints so produced are greatly admired by most people, but unfortunately are very liable to fade. When the prints are washed before being put into the above toning bath, they are more difficult to tone; this plan is however the safest as regards the permanence of the print.

Prints on plain "Papier Saxe," excited with ammonia-nitrate of silver, toned with sel-d'or, and then fixed with fresh hypo, are very permanent. They are sometimes of too cold a tint, and look dry and mealy. A little serum of milk with the salt bath greatly improves them in the above respects. We have never seen a faded print by this process. If the lights are too yellow, this will be corrected by adding a little muriatic acid to the sel-d'or bath. The ammonia-nitrate should be applied with a brush twice, and the paper dried by a gentle heat, and used at once. Ammonia-nitrate gives better whites than plain nitrate, but the sensitive papers will not keep; they turn brown as the ammonia evaporates.

The simplest and best printing process is, in our opinion, that which we have described in *Notes*, No. 42. This requires no toning bath, and the prints exactly resemble engravings. The negatives should not be quite so dense as when they are required for sun-printing.

Some years ago, we sent Dr. Hill Norris a print from one of his beautiful Dry Collodion negatives, a small stereoscopic subject full of detail, *and not too dense for development printing*. In a letter from him, alluding to this print, he says: "I have had the pleasure of examining the very beautiful print you sent me. It is really a great point to achieve so excellent a tone without the use of the toning bath."

In all printing operations, a good deal depends upon the condition of the nitrate bath. We have lately received a valuable communication on this subject from a former correspondent, "N," which, with his permission, we have published.

[Ed. P. N.]

"*Taylor*." Apply to Dr. Norris, 98, Lichfield Street, Birmingham. [Ed. P. N.]

"*J. W.*" You can print by development on albumenized paper. Use equal proportions of albumen and water, and 6 grains of salt to the oz. Add one grain of citric acid to every 2 ozs. of nitrate bath. Then proceed as for plain paper.

[Ed. P. N.]

"*A Constant Reader*." Apply to Mr. Gutch. See his advertisement. [Ed. P. N.]

"*J. F.*" Your friendly advice is acknowledged with thanks. [Ed. P. N.]

☞ *The Communications of G. Bankkart; H. K.; J. L.; E. W. Holmer; T. B.; and the Replies to An Amateur, Isle of Wight; and An Old Subscriber, will be given in our next.*

Photographic Notes.

JUNE 15, 1858.

We have received a great number of orders for the proposed shilling pamphlet which is to contain the account of Mr. Pouncy's process of Printing in Carbon, and begin to hope that our plan of purchasing the process of him and publishing it on our own account, may be carried into effect. If we can secure orders for a thousand copies, we will take our chance of disposing of another thousand, at two shillings each, through the trade, and arrange with Mr. Pouncy at once. Those who order their copy direct from us, and before we close our list, will therefore get it for one shilling instead of *two*, which would be its price afterwards. But the present state of the list, although promising, falls as yet far short of a thousand; still everything must have a beginning, and the difficulty we have to contend with is that of inducing men to sit down and write a letter, even for a thing which they really want, and which cannot be obtained in any other way. In many instances we have been greatly pleased with the interest taken in this matter by correspondents, and also with their liberality, not a few having requested us to put their names down for *five* shillings, if necessary. One of the first orders we received was from Mr. Rejlander, who says, "I, for one, am obliged, by the onerous duty you take upon yourself as to the purchase of Mr. Pouncy's process, and I will guarantee *ten* shillings to be sent when required." Many thanks to this gentleman; we wish there were a few more as much in earnest as he.

That our proposition may be clearly understood we will briefly repeat it. Whoever would be glad to give a shilling for a pamphlet containing Mr. Pouncy's process of Printing Positives in Carbon, may enclose us an order worded thus: "for Mr. Pouncy's Process," adding his address, but enclosing no stamps, the receipt of money at this stage of the proceeding being troublesome to us. When these orders reach a thousand, we will purchase and publish the process, leaving it to those who have promised to redeem their pledge. Another thousand copies will then be distributed among the trade, and the price of them will be *two* shillings each.

We desire no profit in this transaction, but will give our trouble, take all risks, and print the edition of two thousand copies for nothing. But should any profit arise out of it, the amount shall be devoted to any charitable purpose that the majority of our subscribers may suggest. There is a Literary fund, and an Artist's fund; why not a Photographic fund, for the relief of the families of professional photographers in distress? We would suggest then that any profit which may arise out of our purchase of Mr. Pouncy's process should be placed at the head of a subscription list for a Fund of this kind. But let us not "count our chickens before they are hatched." Some hundreds of our readers have yet to make up their mind to write a few words upon a piece of paper and commit it to the post; really an arduous task—a serious duty to perform. Will they do this, and help us in a good work, or are we after all to be doubly disappointed, first at finding that a valuable process must still be kept a secret; and secondly, that we cannot rely upon the hearty co-operation of our readers in carrying out an important object? We have all along endeavoured to do our duty in the conduct of this Journal, by bringing forward and discussing, to the best of our ability, whatever matters seemed to be indicative of progress and improvement in Photography, and by stating frankly the results of our own experiments. No doubt there are some shortcomings and imperfections to regret, but our heart has been in the work, and to all appearance we possess the confidence and good will of a greater number of readers than are required to assist us in a matter in which all are equally interested. We hope then that this appeal will not be made in vain. But there is an old saying, that "what is everybody's business is sometimes nobody's." This will not do. Everyone must put his own particular shoulder to the wheel and beg his friends to do the same.

Some of Mr. Pouncy's prints may now be seen at the Exhibition of the Photographic Society in Coventry Street. They have been condemned in the Review of the Exhibition which appeared in the Society's Journal as inferior in colour and detail to the best of the prints by the old processes. This *may* be true, but colour is a matter of taste, and with respect to detail no inference can be drawn from a comparison between prints without also comparing the negatives. The fact is, the Society does not think fit to patronize Mr. Pouncy and his process. He is a plain-spoken man, and denounced at one of their meetings the present methods of printing in terms which they did not think fit to report; asking also at that time one hundred and fifty guineas for his process. So Mr. Pouncy was sent about his business, and his prints condemned

to the same limbo as Positives by Artificial Light. In future, the inventors of new processes of *value* will no doubt take warning by what has happened to Mr. Pouncy, and not go out of their way to invite the aid of the Photographic Society.

A few days ago we were shown some painted photographs on paper. The artist was a student of the Royal Academy, and the pictures were highly finished, a great deal of time and pains having been bestowed on them. They were, however, unfit for exhibition, from the photographs having faded and turned yellow. What a loss of labour to the artist, and what a disappointment to the purchaser, are such accidents as these, unfortunately but too common! Now, on the most disparaging estimate of Mr. Pouncy's prints, they are certainly good enough for retouching; this circumstance alone should recommend the process to every conscientious professional photographer who avails himself occasionally of the assistance of the artist; or if the conscience of any such gentleman should require a stimulant, let the public *insist* upon the basis of the picture being carbon, now that Carbon Printing can really be accomplished. We have for years deplored the unfortunate want of permanence of positive prints. Who would waste his time in blowing, or his money in buying, soap-bubbles, beautiful though they be? Let us then, with one accord, endeavour to urge on towards perfection that new and important step in Photography—CARBON-PRINTING.

There is a curious letter in "Notes and Queries" of May 22nd, on this subject, signed "Sholto Macduff."

Mr. A. Ross, of Featherstone Buildings, informs us that he is about to manufacture Compound Landscape Lenses, on the principle of M. Petzval's, and that he will send us for insertion in our next number, a "popular comparative digest of the ordinary single Landscape Combination, and M. Petzval's Orthoscopic combination." This will no doubt be a very interesting paper, and we have requested him to let us have the communication in good time.

A letter from M. Voigtlander, in reply to the last from Professor Petzval, will be found at page 147. We hope now that this angry controversy will cease. The facts of the case are sufficiently clear.

We have received, from various quarters, very favourable accounts of Mr. Fothergill's Dry Collodion Process.

Our readers, at least those who practise the Waxed Paper Process, should certainly read Mr. Lawson Sisson's little book, illustrated with two very nice stereoscopic subjects. We have a good deal to say about this process, as soon as we can find time and space. Paper immersed in dilute muriatic acid and rinsed, before being waxed, shows an even structure, free from granulation, and all the free alkali is neutralized.

Our time is just now greatly occupied in putting the last touches to a Photographic Dictionary, and correcting the proofs. This work will extend to between 300 and 400 pps. and has occupied most of our time for the last six months. There are some articles which were promised for this Journal, but which have been unavoidably deferred from time to time. As soon as the Dictionary is fairly "under weigh," we shall return with redoubled energy to the "NOTES," and the experimental labours of the dark room, which supply some of the materials for it.

MACCLESFIELD PHOTOGRAPHIC SOCIETY.

The Members of this Society held their first Meeting for the discussion of Photographic matters on Wednesday, June 2nd.

A paper was read on "Dr. Hill Norris's Dry Collodion Process," illustrated by experimental manipulation and apparatus, by Mr. W. B. Osborn, Treasurer of the Birmingham Photographic Society. This paper will be shortly published in our columns.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

General Meeting, May 25th, 1858.

The Vice-President, W. HOWELL, ESQ., in the Chair.

The Minutes of the last Meeting having been read and passed, the Secretary announced, that in accordance with the notice given at their last sitting (this being the last meeting of the present Session), the Council propose to make on this evening, their FIRST PRESENTATION OF PHOTOGRAPHS to the Members. The pictures, being of different subjects, will be balloted for.

Pictures to the value of nearly £4. were then balloted for.

The CHAIRMAN then called upon MR. BOURNE to read his paper on

THE APPLICATION OF PHOTOGRAPHY TO BUSINESS PURPOSES.

Napoleon, by contrast, styled the Great, once contemptuously stated his deliberate conviction that "England was a nation of shopkeepers"; a remark, which to this day has met with no denial, and in all probability is destined never to be contradicted. Doubtless, that far-sighted man afterwards discovered, that hidden in that all-

absorbing love of traffic, lay the real secret of England's immense power, irrespective of Industry's twin sister, wealth. Sufficient, that other nations have, by their humble imitations of our business propensities, learned to look upon the sword as a mere auxiliary in the structure of a nation's greatness.

The principle of self is so deeply inherent in us all, more or less, that on the accidental discovery of any wonder in science, we are led to examine in what manner it may be made subservient to our worldly aggrandisements and to grapple with it till bound hand and foot in slavish attendance on our increasingly varied and capricious wants; using it as a chariot wheel for the purposes of trade, or to pander to our love of pleasure.

This may at first sight appear very low ground, but a slight recollection will show it is not so in reality, for I ask, what, of late years, has been so beneficial in promoting the cause of civilisation as railways, and I conjecture, without fear of contradiction, prospective, and I might add perspective dividends, played no small part in their rapid spread throughout the land.

Besides, I repeat, it is to commerce England owes her ascendancy over other nations; and what is commerce, but the aggregate endeavours of individuals to acquire pecuniary advantages? That these endeavours are made in unjust ways as well as just ones, as lately we have had so many opportunities of knowing, rather tend to strengthen my assertion that self-interest is *a* motive power in discoveries of a scientific nature.

This point settled then, we proceed to notice a few of the multifarious ways in which photography has been applied to business purposes. The primary effect of the discovery, after the surprise it excited had somewhat abated, was to call into existence numberless likeness-takers; men of a rather scientific turn of mind, and in some cases perhaps, unfitted for any other pursuit. Indeed, of late years, since the lamented Mr. Scott Archer's Collodion Process was thrown open to the world, the name is legion of those who earn their livelihood by presenting you with "your likeness, coloured, in a magnificent frame, for the small charge of one shilling." More particularly in sea-port towns, where "Jack" is rampant, is to be noticed this increase. I was, myself, struck with the quantity in the main street leading from Plymouth to Devonport, nearly every other house being a photographic establishment, and in some cases as many as three together, all doing *literally*, a roaring trade; some man, by no means a candidate for the Hospital for Diseases of the Chest, stationed at each door, with persuasive eloquence, requesting you to step inside. It is only natural to presume they answer as a commercial speculation or they would not be there.

Now, I take it, this "holding the mirror up to nature" in a highly popular form, must have a tendency to elevate the humbler classes, who, surrounded by these scientific substitutes for daubs and scissor-cut profiles, are led to enquire into some of the first principles in the chemical action of light; and the spark of intelligence once ignited, is perhaps soon fanned into a flame, exciting a thirst for knowledge on other subjects, difficult to appease. I remember seeing a notice of a trip to the Lickey Hills a summer or two ago, every pleasure-seeker on that occasion receiving a likeness of himself, or herself, in a frame, taken on the spot. Imagination paints some bashful son of toil whose brawny hands testify to their owner's disregard of hard labour, yet diffident, when wishing to make to some coy maiden an avowal of love and constancy. What opportunity so good, as when amid the freedom of nature's beauteous scenes the swain comparing with his dulcinea the artist's attempt to pourtray their facial characteristics? What opportunity so good to exclaim unconsciously with Shakespeare, "Look on this picture and on that," and to add, but not with Shakespeare, "how well them two 'ud look together!" Imagination fancies these two, (now happy parents) looking back with pleasure to the day when the business necessities of some humble photographer caused his attendance at a gipsy party to take likenesses. I might dwell upon the pleasure afforded by the possession of life-like portraits of those whom we love or respect. I might touch on the good the picture of some venerated mother, now no more, exercises over some son, who, his wild oats unsown, is restrained in some wrong doing by that sainted look, in which warning and benevolence are so plainly mingled. But my subject demands my withdrawal from those more fruitful themes.

Photography has been applied with great success to the business of Medical Men. Dr. Diamond, in 1856, read a Paper before the Royal Society, in which he showed how beneficial is this science in cases of lunacy. A patient at one moment may be full of gaiety and pleasure, and at another, dejection and despondency hold their sway. The photographer catches instantaneously the cloud or the sunshine of the soul, thus enabling the metaphysician to witness and trace out the connection between the visible and the invisible in the philosophy of the human mind. These records thereafter form a guide by which to act in other cases. Dr. Diamond also stated that cures in cases of insanity may be effected by means of portraits themselves, and gives the following account of a case in which photography, as he conceives, unquestionably led to a cure:—

"A. D., aged 20, was admitted under his care in August, 1854, having been recently discharged from Bethlem Hospital, after a year's residence there. Her delusions consisted in the supposed possession of great wealth and of exalted station as a queen. Any occupation was therefore looked upon by her as beneath her dignity. It was not without great persuasion that this patient was induced to allow herself to be photographed; but when she saw her likeness, and was led to converse upon the subject of her delusion, an improvement took place, and she was eventually discharged cured."

The author also showed that portraits were highly useful in case the patient, having left cured, should have a relapse, and require re-admission into the hospital, when the former likeness has been found more useful in calling to his mind the care and treatment than any recorded description could possibly be. T. N. Brushfield, Esq., Superintendent of Chester County Lunatic Asylum, states the gratification patients, under his care, evinced at being shown their own portraits, or those of friends, and that a woman who had been one of the worst cases, begged for a portrait of herself, that she might send it to her son in Ireland, to show how much better she was. So many other circumstances will so readily occur to the minds of all my hearers, in which photography could be made serviceable in Surgery, that it is needless for me to particularize.

Then again, reflect on the immense use this noble art is to the Detective Officers. Happening to need the services of this useful fraternity, I was struck with the numerous likenesses, suspended in the office, of different ladies and gentlemen whose avocations were of a doubtful character, thereby rendering their apprehension at any future period, when found necessary, a work of great facility. In fact while in the office, one policeman in plain

clothes, having just received per post a photograph of some one "wanted," handed it to another, with the question "Do you know that?" receiving in reply "I should think I do, rather!" The inference is easily drawn. By the way, it is a curious fact that criminals always manifest great interest in their likenesses and are always particularly anxious that they should be good ones. Again, a strong advocate of Teetotalism having tried in vain to convert a tippling brother, made it his business to photograph him when considerably the worse for liquor. The likeness, with its silent moral, shown to the brother when sober, produced the desired effect, and another disciple was gained to the cause of Temperance. Dr. Roulston, of Leeds, recommends that immediately upon a dead body being found, two or more photographs should be taken, so that a perfect fac-simile of the features, both in full and profile, should remain for the inspection of those who have lost friends or relatives, and who would by this means frequently be relieved from a state of agonizing suspense, when the putrefaction of the corpse no longer permitted of recognition. Every one knows that the morbid curiosity of the lower orders in Paris, and more particularly of young girls, leads them frequently into the "Morgue," where the dead bodies of those who have met with a tragical end are exhibited in a nearly nude state, on a stone slab, on a gentle inclination, waiting the recognition of friends. I cannot but think photography might be there substituted with advantage.

The Play-writer has even made this art subservient to his business, for the London Newspapers have lately informed us of a farce, produced at the Strand Theatre, entitled: "Your Likeness, One Shilling," in which is graphically and amusingly depicted the fear into which some photographer plunges an old lady customer by sundry technical allusions to his professional apparatus, and the process of focusing *more especially*; causing immense laughter. Again, with what benefit is photography used by an artist when engaged on a portrait of children. How extremely difficult to retain them in one set position, and with one expression of countenance for any length of time!! Whereas the collodion process enables the portrait painter to dispense with the frequent posturing required in such cases. It is reported that while Sir Thomas Lawrence was pourtraying on canvas the features of some noble peeress, a collision occurred between them from the want of stillness in the one, and the insisting of it by the other. Had sun-printing been then known and adopted, the end would have been attained without any loss of temper on either side. I am fully aware that many eminent artists look with great distrust on the adoption of photography to their assistance, but doubtless, as "Time works wonders," these Conservatives in painting will gradually give place to others of a more Radical turn of mind, who, with the energy which accompanies youth, will gladly avail themselves of the mechanical exactness which a photograph will give, and yet find abundant scope left for the genius of the true artist.

A talented member of your Society, (Mr. Rejlander) has so recently shown you its applicability to picture composition, in the arrangement of figures, that it is needless for me to enlarge.

That the copper-plate engraver will yet make great use of this art in his business I confidently believe, though, its application either to copper, steel, or box-wood engraving, must be considered as yet in its infancy.

Again, the abortions got up to amuse little children in the way of magic lantern slides, will at once suggest with what propriety photography can be applied to their improvement.

The Librarian is just beginning to appropriate its benefits. By its means, a catalogue is formed of photographic fac-similies of the title-page of every book, in miniature, so that any bibliopolist can at once tell which edition of any work he would select.

The Astronomer soon found his business was not only facilitated, but rendered more accurate by its use. Professor Bond, of America, was the first who surmounted the primary difficulties. He successfully produced miniatures of the moon, which when examined by a microscope, showed clearly the dark and light spots, serrated shadows and mountain peaks with which that interesting, but as yet unknown region, abounds. One of the stars in the constellation Lyra, has already been photographed, and from the supposed distance of that star, the light is calculated to have taken more than twenty years in passing down to the prepared silver or paper surface.

To the Commercial Traveller, this art has been an immense boon. Instead of carrying great, heavy samples, a pocket-stereoscope with the veracious copies of his wares answers every purpose. I beg to offer as an illustration of this part of my subject some photographs of Toast Racks, &c., and I can, from my own experience prove how serviceable is photography. I also, by way of contrast, show a lithograph copy, in which you will observe a great want of perspective, the handles all turning round in a most unartistic fashion. Besides, customers when looking at engravings or wood-cuts, invariably allow a slight per centage of beautiful lines and curves which exist only in the imagination of the draughtsman, and not on the article; now, as Nature never told a lie and never can, a photograph of any article carries conviction with it. Pianos, to wit, being somewhat inconvenient to carry round the country, in variety, for sale from samples, are found, when their pictures are viewed through the medium of a stereoscopic magnifying glass, satisfactorily to exhibit all their solidity and beauty, without actual presence. Customers when requiring articles to match, now send per post a photographed copy of the goods required and can rely on procuring exactness. When, in cases of emergency, manufactures of an elaborate description are hurried away to their destination, minute graphical detail is dispensed with, by the agency of light-printing. As mementoes of manufactured articles I submit three copies of ecclesiastical vessels, made of silver; also a monument made of marble and brass, all of which will well bear minute inspection with a powerful magnifier.

Messrs. Padbury and Dickens, of the Sandpits, Birmingham, have most kindly permitted me to illustrate my subject with the accompanying copies of Art Manufacture, and which as specimens, both of photography, and its utility to business, are well worthy of close examination. A microscope would, I think, be found considerably to assist in their due appreciation and inspection.

Messrs. Wright, of Salsley, have lately used the art for preserving to them the form and general appearance of the magnificent Railway Carriage just sent off to the Pacha of Egypt.

Bennett, of Exhibition fame, has by it, copies of the clock-works he erected at the Houses of Parliament and at Balmoral, thereby facilitating any correction when requisite.

I have seen it recommended that railway accidents and war, should both be brought under photo-

graphic supervision. In the case of a collision taking place, a photograph would at once be made strictly impartial evidence and so prevent important differences which will creep into the statements of different eye witnesses of catastrophes of that nature. In Austria this has actually been accomplished on more than one occasion. And though for the purposes of actual warfare, it has yet been but little used, if at all, unless the milennium speedily arrive when "our spears will be turned into pruning hooks," even in our day we shall hear of its application by aide-de-camps and reconnoitering officers when sent by their commandant to ascertain an enemy's position; thereby avoiding a waste of time by lengthy verbal descriptions, and facilitating rapid movements. We all remember, how some adventurous English Captain, just prior to the recent war, made a pretext for entering the harbour at Sebastopol, and used the short time allowed him, in taking photographs of the fortifications for future use. In connection with Russia, you will doubtless remember that an English Engineer constructed over the river Dnieper at Kieff, the most magnificent suspension bridge, perhaps, which the world possesses. The powerful Emperor, far away from Kieff, but impatiently longing to know how the work progressed, caused photographs to be sent to him periodically, showing the exact state of the bridge at a given time. Two thousand miles of distance were thus practically annihilated; and the Czar could know all that was going on, without stirring from his palace at St. Petersburg, by comparing the photographs successively forwarded to him. The crafty autocrat knew too well the little reliance to be placed on drawings prepared by his mercenary subordinates, and must therefore have hailed the advent of photography with much secret pleasure. Stages of progress in numerous works of art and of ingenuity can thus be easily registered, as it were; for each photograph tells a true tale concerning a particular spot at a particular time.

The photograph now exhibited of a steel engraving, illustrates its service in copying rare works of art, or articles of *vertu*.

I have thus then endeavoured feebly and inadequately I admit, to point out some few of the purposes of commerce to which photography is, or can be applicable.

Should any words of mine to-night suggest to some brother member its applicability to some purpose conducive to industrial art, or the extension of knowledge, to which as yet, *he* has not applied it, the evening will have not been wasted.

And of those present, to whom perhaps this paper has appeared a dreary occupation of precious time, I ask their kind indulgence. To each and all for their sympathetic attention, and more especially to those, to whose kindness I am indebted for some of the specimens now exhibited, I beg to tender my most heartfelt thanks. Believing, as I do, that to make a Society strong and useful, the energies of every individual member should be called out; as *one* I have done my best; that it is no better, please accept my apologies and overlook the defects for the sake of the motive. (Cheers.)

Some discussion followed, and the pictures brought by Mr. Bourne were handed round, and greatly admired.

Mr. Osborn then rose to propose a vote of thanks to Mr. Bourne. He said that the Application of Photography to Business Purposes was of very high importance, and he had frequently urged upon manufacturers the utility of such a course, but was sorry to find that it did not meet with much favour; one reason was, probably, the high price which Photographers put upon their services, as it must be borne in mind that cheapness was an essential quality in this application, and operators must look to the quantity to pay them, while, at the same time, they must not sacrifice quality. He had, however, great pleasure in moving a vote of thanks to Mr. Bourne for his interesting paper, which he was sure all present would agree in saying, had but one great fault—that of being too short.

Mr. Phillips seconded the motion.

The Chairman said that he perfectly agreed with the views advanced by Mr. Bourne, and he hoped, that as the Society numbered so many young men among its members, they would follow the good example set before them during the session just closing, and open their stores of knowledge for the benefit of others. He would impress upon them the utility of jotting down any observation that might strike them when in the field, and hoped that they would occupy the vacation well in adding to their store of knowledge as well as of pictures.

Mr. Bourne having responded, the Meeting then adjourned for the vacation.

The first Meeting of the next Session will be held on Tuesday, August 31, when a paper will be read on "The Chemistry of Photography," with experiments, by Harrison Branthwaite, Esq.

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEARS 1856-7.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Continued from No.* 52.]

I found on my return to Edinburgh that I had quite repaid myself for the trouble and expense of this little trip, and brought back a very nice collection of negatives, calculated to do good service at a future day.

I much coveted one of Edinburgh old town, but the opportunity allowed occurs so very seldom, from the smoke and thickness of the atmosphere, that even resident photographers have waited in vain. I obtained some good ones of Scott's Monument, Holyrood, (the Chapel quite worth a day or two's work bestowed on), and very *comeatable* and quiet.

The endless bits of street architecture in the old town of Edinburgh are very tempting; but having had one taste of the quality of the lower classes in Princes Street Gardens, when I was at last obliged to call in the aid of a policeman, I did not summon up courage enough to attempt any views in the Congate and Cannongate, beautiful and picturesque as they would have proved; for instance, John Knox's house, or those venerable old houses near the House of Assembly. So failing in the town, I wended my way to Roslin and Hawtharnden. The Castle is such a mere fragment that otherwise than grouping and forming an integral part of the general landscape, it is

scarce worth putting up the camera to take. Not so, however, the Chapel. This is so closely encircled with a wall that you can only get very near views and therefore only bits, but these are quite worth taking. The interior I did not attempt, the very yellow light of the old glass not promising any possibility of success, though the architecture is strikingly beautiful. A general or distant view of the Chapel is anything but picturesque, it looks more like a family mausoleum, and the accessories are not harmonious and not at all calculated to form a good picture.

Having in vain waited for anything like a chance of getting a good photograph of the old high houses on the other side of Princes Street Gardens, I determined on another railroad trip, and this time wended my way first to Dumfernline, a miserable and dirty town, and possessing an Inn that I should hope is unique, surpassing in filth and dirt, and therefore discomfort, any that I have ever been in in civilized Europe; so that instead of sleeping, for I verily believe had I halted there for one night nothing would have been seen of me in the morning, I remained long enough to take some nice views of the fine fragments of ruins of the old Abbey, again surrounded by a church-yard, and got into most comfortable quarters at a most excellent Inn, at Cupar. After breakfast, there being nothing of any interest in the town, I proceeded on to St. Andrews, a quaint and most picturesque old town, quiet enough, and I hear very aristocratic. At any rate the situation is quite enough to tempt one to remain some little time, independently of the interest attached to the ruins of the old College, Church and Castle, all most interesting and capital studies for the photographer and draughtsman. The coast scenery too is very interesting,—the harbour, and even the town itself.

A couple of days may be well spent here, there being plenty of work and beautiful studies. From here I proceeded again by railway to Perth and on to Dunkeld. I may mention, *en passant*, that both at St. Andrew's and Perth there are several very clever photographers, especially the former, whose museums are open to any visitors, and quite worth going to see. With Dunkeld I was well acquainted, and found it in every respect as I had seen it nearly 20 years ago; the same comfortable Inn, the same lovely river, and the beautiful hills, pine-covered, surrounding it on every side.

Here, meaning to remain some little time, lodgings were sought, and at the early season of the year, readily obtainable, as comfortable in every respect as could be desired, at Mr. Blain's, exactly facing the Hotel. Whilst photographing the interior of the Cathedral, or ruins of what it formerly was, the Duke of Atholl introduced himself, and to his kindness and consideration during a fortnight's sojourn, I was indebted in no small degree, seeing much that I should not otherwise have seen, and taking many photographs that would otherwise have been impossible. He prides himself much on his new Dog Kennel for a pack of Otter hounds; noble studies, and well worth any pains-taking to accomplish.

I much sorrowed that I could not be present at the Highland gathering, which doubtless would have offered plenty of occupation for the quick-working process,—picturesque groupings and costumes of every hue. The kilt seemed to be very generally used by the gentry around Dunkeld, Blair and Taymouth, and doubtless for the summer months it may prove cool and pleasant; but the trews I should crave for in winter. A fortnight slipped away quickly, as it always does when agreeably occupied. His Grace kindly gave me a letter to his factor, Capt. Macduff, at Blair, and though there is not much of interest here; still, as it was for many weeks the residence of Her Majesty it of course is worth looking at. The exterior of the house is ugly in the extreme, very much resembling a parish Union workhouse, and anything but like what one would picture a Highland Castle. A photograph of the Castle, one of the Inn, and one of a small hut, a very pretty fall of the Fender, in the grounds, completed my work. Before and after dinner was necessarily dedicated to repose, and the ride back to Dunkeld, than which scarce anything can be prettier, through the pass of Kellianarken; and at every turn of the road fresh beauties present themselves, with the sparkling Tay several hundreds of feet below the road, still bright and glistening, even at that distance.

I was sorry when the day came to leave Dunkeld and all its unnumbered beauties, still I was forced to do so, as if work is to be be done it does not do to loiter. Taymouth was the next place of halt, and here, for the first time, imposition was attempted; the wax-light system and other items in proportion; a deduction was asked for and refused; the only alternative I had was to strike off the article, service, stating at the same time my reason for so doing. The parting of course of host and visitor was disagreeable. Taymouth Castle is quite worth a morning's work; the situation is unrivalled for its beauty; but the landscape scenery is too extensive for any camera to do justice to it; nevertheless, two or three ruins of the house are quite easily managed, and will well repay the photographer. There are, too, some noble studies of trees in the park. The village is very pretty and picturesque, and the sun and the surrounding houses group very nicely and make a very pretty subject. There are, too, some very pretty bits of costume in the peasants; but for all this, a day or two is, of course, needful and the extortion of mine host was not calculated to induce any lengthened stay.

A very pretty ride along the borders of Loch Tay brought the traveller to Killin, and for instantaneous pictures here are some unusually fine studies, whether of the falls, which are very fine, close to the town, or the rapids formed in the rocky bed of the river. It was a bleak, cold and uninviting day unfortunately when I was there, and feeling unwell into the bargain, I was induced to push on and not sleep as I had arranged to do. A wild ride through one of the wildest of the Highland passes, and a ride full of picturesque beauties, brought us by 8 o'clock to Callandar, where being early in the season, lodgings were easily met with. I do not know that there is much to be done here except the river scenery, and falls at the bridge or pass of Lery. An easy ride takes the traveller from here to Dunblane, where there is a nice lot of ruins, and

the railroad is then joined to Stirling; several beautiful points of view are here easily to be met with, and on the return journey to Edinburgh, the dreary old pile of Lorlithgen Castle is quite worthy of a visit. Three weeks had thus slipped most agreeably away and the bright weather once more appearing, and there being many miles yet to be accomplished and much to be photographed, one bright morning, the very opposite to that on which the town was first approached, the railroad was once more racing us away, this time to stop at the entrance (as it were to the Lake district of Cumberland and Westmoreland), of the Oxenholme station of the Lancaster and Carlisle Railway, which it was my wish thoroughly to explore and delineate, and therefore the months of June, July and August, were set apart for that purpose. A peep of a week at the Manchester Exhibition, its wonders, its photographs, and the conclusion of a most delightful summer photographic ramble through a part of North Wales, Llandudno, Conway, Bangor, (Anglesea and Holyhead) must form the subject of my concluding paper, if indeed you feel disposed to devote so much of your valuable space to these desultory jottings and recollections; not I trust, however, without offering some hints worthy the consideration of my brethren in the gentle art.

VOIGTLANDER versus PETZVAL.

To George Knight, Esq.

Dear Sir,—I am very happy to see that my last letter to you has been inserted in the Birmingham Photographic Society's *Notes*, which also contains another letter from Prof. Petzval, in which my name is mentioned.

I do not wish to tease the patience of the reader too much, and have only to say some few words in answer to that letter, particularly as little is left for me to add to the assertions in my last letter.

Professor Petzval, instead of coming to the point at once regarding me, again contents himself with sarcastic remarks on the word "Orthoscopic," devoting half a page to that purpose. Even suppose my having misapplied that word, how can a man of Professor Petzval's faculties make so much ado about nothing? I have however no right to complain of his wit, seeing that he does not even hesitate to ridicule a whole nation, calling it *La Grande Nation*, on no other account than because a committee of Photographers and *scientific men*, (I shall add), have dared to find my (or to speak more correct, his own *soi-disant)* new lens superior to all others, giving him all the credit of the invention. With far greater right he might declare war with all England, because not only my lenses have been found good by English photographers, but particularly because an English assembly have dared not to feel enlightened by a lecture on his works, but has been so audacious as to pronounce not very flattering at all events. I should like to know whether it can be considered dignified to draw a whole nation into a private affair; and no eloquence of mine could have painted Professor Petzval's disposition in more lively colours than he has done himself. I shall pass over his description of the very empirical way he supposes my having employed in copying the lens, as well as over his calling my proceeding an expeditious mode of making an invention; the first is too absurd, the latter untrue, for never have I laid any claim to the invention either of the lens, or the name. It may be observed that my last letter, by which all these insinuations are repulsed, was not known to Professor Petzval at the time he was writing his last letter,—very well; but my *memorial* was known to him; he was pleased to call it an *absurdity;* but very far from being an absurdity (if my statements *were not true)* it would rather be a *shameful piece of imposition,* and I should like to know to what circumstance I am indebted to the forbearance of Prof. Petzval in both his letters; he has only sharpened his wit in various things, and has rather evaded the question of my being in possession of the drawing and the curvatures of that lens. To give a further proof to any non-prejudiced mind, how the affair stands, I will say one thing more: Prof. Petzval has taken a patent in Austria for his new lens; in spite of that patent I have openly sold the same lens, distributing every where my circulars about it. How is it that Prof. Petzval does not *proceed against me* on that account? Very simply because he is aware that by producing the paper I was so often speaking of, I should not only repulse his attack, but at the same time upset his patent, and by not taking the first step, the world may at least see that on my part no pecuniary consideration has got anything to do with that affair. The answer of Professor Petzval will, however, soon appear, and should he evade the question again I shall consider myself excused giving further reply, but should he carry the thing so far as *particularly to deny* my being in possession of that document my final answer shall follow, and with it such proof as will put the whole transaction beyond any doubt.

With regard to Mr. Paul Pretsch's observations I have only to state this, the lecture of this gentleman, from which he supposes my having got first any tidings about the lens, appeared on December 21st, 1857, and is but a translated extract from various reports of Professor Petzval to the Academy in Vienna, delivered already on March 12th of the same year; my first Orthoscopic lens arrived in Vienna at the *beginning of November*, and my memorial, together with four different sized lenses, were handed to the Academy about *December* 24th. The observation of this gentleman may therefore well rank amongst many of Professor Petzval's—founded upon nothing at all. Further, I take no notice of his letter. I have not the honour of knowing Mr. Pretsch, nor has he the disadvantage of knowing me, as far as I am aware. The affair lies entirely between Professor Petzval and myself, and no third party has any right to interfere. Professor Petzval may want an *agent;* but certainly can dispense with a proxy; should Mr. Pretsch continue in his personal attack, he may do so; but certainly he will never receive any answer from me. Perhaps some consideration will show to Mr. Pretsch that such a proceeding

against a man who never injured him in any way, would not be honourable and gentlemanlike, and would carry in itself its judgement.

You will oblige me by causing these lines to be inserted in the same Journal.

I remain, Sir, yours truly,

VOIGTLANDER.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

PECTINATE STOP OF A VIEW-LENS.

To the Editor of Photographic Notes.

SIR,—Having invented a method of stopping the view-lens for the purpose of modifying the light of the sky and the distant parts of the landscape, I have much pleasure in communicating it to you.

I propose to call the arrangement a pectinate stop; the most general form of the stop being like a comb.

I have adapted this arrangement to the Orthoscopic lens, to which it is most easily applicable; but it will also be found applicable to the ordinary view-lens, the conditions being reversed as regards the position of the stop. A disc of cardboard or thin metal being cut so as to fit with the cap of the Orthoscopic lens, a semi or semi-lunar portion, is cut out, and the remaining portion indented like the teeth of a comb; this being placed in front of the lens, and the new stop being also used behind the lens, the light of the sky is considerably modified, and the illumination of the picture rendered much more equal than before.

I have tried the arrangement with Voigtlander's No. 3 lens, and found the performance of both the lens and of my new stop most satisfactory. The stop of 1-in. aperture behind the lens was retained; focus 25-ins., size of plate $17\frac{1}{2} \times 15$-ins.

I may remark that it may be found requisite to have various stops to suit the intensity of the sky, and the position of the line of the horizon in the picture, and that the apparent effect of the new stop in diminishing the light on the focusing glass is much less than would be anticipated, and that even when buildings or trees project considerably above the line of the horizon, the new stop may nevertheless be used.

A friend, to whom I have suggested the use of the pectinate stop, reports that it has enabled him to obtain effects of distance which he had otherwise found impossible.

I also anticipated that under favourable circumstances this method of stopping will enable us to obtain photographs of clouds with a fair development of the landscape, and will also give a greater scope to artistic talent in modifying the effects of light on the picture.

Yours respectfully,

WILLIAM SYKES WARD.

Claypit House, Leeds.

—The "pectinate stop" would we think be better placed at a little distance in front of the true stop of a common view lens, as suggested by Mr. Howell, in *Notes*, No. 45. The principle of Mr. Read's stop appears to us to be more correct; for when its plane is inclined to the horizon, the pencils from the foreground objects have a circle for their base, those from the sky an oval of less area, while in the "pectinate stop," the base of *all* the conical pencils which diverge from the bright points of the view are of *equal* area and shape. Our correspondent will, if he thinks this carefully over, perhaps agree with us; but if not we shall be glad to hear and insert his objections to our reasoning.

We do not see exactly how to apply Mr. Read's stop to an Orthoscopic lens. Has he any suggestion to offer on this subject? [ED. P. N.]

DRY COLLODION PROCESS.

To the Editor of Photographic Notes.

DEAR SIR,—Although your printer has done, perhaps, more than justice to the rough materials he had to work upon, in the shape of notes of my observations at the late meeting of the Birmingham Photographic Society, there are a few errata which it would be unfair to your readers for me to leave uncorrected.

Page 132, line 22, for "expressiveness" read "experiment." Page 133, first column, line 25, leave out "for never, &c."; line 28, for "ebulition" read "ebullition"; line 32, for "œquates" read "æquates"; line 35, for "surprise" read "empirics." Same page, second column, line 5, for "*are loosely*" read "are *so loosely*"; line 11, after "such a process," add, "is confidently anticipated: and the progress which our science has made, &c." Same page, for "Mr. Llewyllyn's original process" read "oxymel process. Page 135, second column, fifth line from bottom, instead of "a copy, and a very poor one" read "by some considered a copy, and, as regards its diminished sensitiveness, a very indifferent one, &c." Let me here, in fairness to the discoverers of the citro-meta-gelatine process, state that one of the finest negatives I ever saw was taken by following exactly the directions contained in Mr. Long's pamphlet).

And now a word or two in conclusion, to your correspondent, Mr. R. L. Jones, in "The Photographer," inserted in the *Notes* of May 1st.

In Mr. Jones's paper he seems to intimate that "albumen upon unsensitized collodion" if capable of being carried out, would supply an important desideratum. Let me have the pleasure of informing him that his suggestion is by no means new; and what is still more important, that it is capable of yielding most excellent results. In the London Photographic Journal of December 22nd, 1856, p. 185, is an account of M. Gaume's modification of the Taupenot process, in which the glass is coated with *uniodized* collodion, then dried, and finally coated with the iodized albumen. The latter film, when dry, is sensitized in the usual aceto-nitrate bath. The resulting negative, M. Gaume states, is more perfect than by the usual Taupenot method, the image clearer and the impression more rapid. M. Bayard, who is reported in "La Lumière" to have experimented with this process, has corroborated M. Gaume's statement.

In a letter I received from Mr. Ackland, 10th December, 1856, he states that he was then using a much more simple process than formerly, with every prospect of success. He coated the plates with any old red collodion (of course iodized), and washed it until the greasy appearance was removed; he then, after drawing off the superfluous water for a minute, poured over the surface, four separate times, Taupenot's iodized albumen, then drained and dried thoroughly. The time of exposure, at that time (10th December), with a lens 4½-ins. focus, diaphragm three-sixteenths-of-an-inch, appeared to be about 2 minutes, in clear sunshine. He developed by first pouring on saturated gallic acid solution, then equal parts of this solution warmed to 100° Faht., and of nitrate of silver solution, composed of 1 dr. nitrate, 2 drs. glacial acetic acid, and 12 ozs. of distilled water. The development required about 15 minutes. In Mr. Ackland's pamphlet "How to take Stereoscopic Pictures," brought out last spring, he states that subsequent experiments having indicated that his success in this simple process was chiefly due to some peculiarity in the collodion employed by him, (to the character of which his researches were then directed), he had returned to a modification far less simple, of the original Taupenot process. Mr. Crookes' modification of the collodio-albumen process, in which meta-gelatine is added to the albumen, complicates, apparently, Mr. Ackland's original idea without any compensating advantage. I will now give you the result of my experience, gathered from many and various experiments with this very simple process.

The first thing required, is a good sample of "dry collodion," i.e. collodion made from cotton immersed for about ten minutes in weak mixed acids at a high temperature. This is now kept by most photographical instrument makers, and may be obtained of excellent quality either from Horne and Thornthwaite, Bland and Long's, Dr. Hill Norris's, and Messrs. Hopkins and Williams'. This should be thinned to the consistence of ordinary positive collodion. Clean and coat the plate in the usual way, and *as soon as the film has all set*, wash in a horizontal glass dish, until the water flows evenly over the collodionized surface. Take it out of the water and thoroughly drain. Pour a small quantity of the iodized albumen at one corner, and allow it to chase off the aqueous film into the sink,—raise it again after the lapse of about a minute to the horizontal position, and dose it a second time with the iodized albumen, which must be left on it a full minute. Pour off the albumen into the filter, drain it thoroughly dry by artificial heat. Excite the plates in the ordinary 50-grain aceto-nitrate bath for a minute,—wash off the free nitrate and dry The exposure is just one third more than for the ordinary Taupenot plates, and the results are fully equal with middle tints more perfect.

Marston Rectory, June 3. WM. LAW.

THE HAND-WRITING OF PHOTOGRAPHERS.

To the Editor of Photographic Notes.

SIR,—Photographers, as a class, must *write* badly. No Photographic Journal appears without some notice of the errors of its predecessor.

I am as guilty as others, but I admit that the trouble I save myself in sending hastily written communications to you and other Editors of similar Journals, is far from being an equivalent for the trouble given to myself by the errors of others, to such an extent, that I never feel that I can place confidence in any fact or formula given in one Journal until I shall have received one or more of its successors. "N."

ERRATA in my last letter, inserted in No. 52.

Page 137, fifth line from bottom, for "5-grain" read "50-grain." Page 138, first line, for "albumenise" read "sensitize"; line 20, for "sensitive" read "sensitising."

A PANORAMIC CAMERA, CAPABLE OF TAKING A PICTURE OF THE WHOLE HORIZON ON A FLAT GLASS PLATE.

To the Editor of Photographic Notes.

SIR,—Before commencing the description of this camera I have to acknowledge my obligations for your kindness in directing me in the path of discovery when I submitted my first ideas on the subject to you.

On looking at Photographic Panoramas, while being highly gratified at the extent of view presented, I have never been able to overcome a feeling of annoyance at the unseemly joins which I think very much mar their beauty. I have for a long time endeavoured to think out a plan of applying the Panoramic principle to collodion. It had been applied to the Daguerreotype, and the Paper Processes, but in these the sensitive surface could be bent, and the question was how to apply it to rigid glass. The problem had always failed to obtain a solution, and I had forgotten the subject when your design (*Notes*, No. 45) revived it in my mind, and after trying various plans more or less defective, I hit upon the one I now propose to describe.

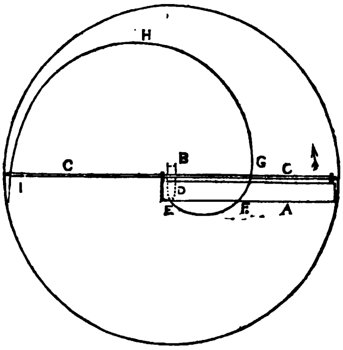
The camera of suitable size, say one that would take a glass plate 10-ins. high, and about 110-ins. wide, with a lens of 15-ins. focus, but any size might be used, large or small, revolves on a circular table, the axis being placed immediately beneath the lens, and working in a brass socket attached to the lateral sliding adjustment of the lens. This does not itself slide but merely revolves on the same axis as the lens, but the camera slides as it revolves, and thus the same effect is produced as if the lens had a sliding movement. A brass screw is fastened at the bottom of the camera at any point, which is found most convenient, and works in an eccentric groove in the table. After the collodionized plate has been placed in the camera, the latter has merely to be rotated by hand, first in one direction and then back again, until sufficient exposure has been given. The eccentric groove or slot in the table causes the camera to slide as it rotates.

In order to construct this camera it will be necessary to ascertain the exact width of the ground glass covered by the circle of the horizon, and that dimension being marked on the camera and divided into any number of equal parts, say 32, 64, or 128, and the circular table being divided into the same number, the camera can be rotated and slid, step bp step, and the course the groove should

be marked, point by point, until the whole is obtained. If the camera be made to include only half the circle of the horizon, it of course need only be of half the width, and the table only about a quarter the size necessary if the whole be included.

I have supposed the focus to be the same for all distances, whether the view be a near or distant one, but a certain adjustment of focus might be obtained by having various grooves in the same or different tables to suit a given number of different foci, as it necessarily follows that the longer the focus the larger the objects will be, and the longer will be also the picture on the ground glass. If only one focus be provided for, a medium one should be chosen, and small diaphrams provided for near and distant objects.

I should have mentioned that the internal rays from the lens are cut off by a tube as in your design (*Notes*, No. 45).



A. Focusing glass and dark slide.

B. Lens and axis. C. Lens slide.

D. Lens tube (see *Notes*, No. 45).

E F G H I. Groove, or slot in table.

Should the camera be made to take only half the horizon, the slot need go no further than G. The first rotation of the camera will be in the direction of the arrow. If any advantage would accrue from getting rid of the projection of the lens-slide, it might be made jointed, like the sliding doors of old-fashioned sideboards, but would then probably require to be lined with black velvet to render it light proof.

W. E. Holmer.

30, Upper Rosoman Street, London. E.C.

MR. POUNCY'S PROCESS.

We publish the following at the request of a kind-hearted friend on the other side of the Irish Channel:—

Brother Photographers,—Pardon my presumption in coming before you and asking you at once to join our list to buy Mr. Pouncy's formula. I do think it would be useless for me to go into the particulars, after our esteemed friend, Mr. Sutton, has informed you of its good and beneficial effects. Surely you will not withhold your mites and let it go by? No, my friends, let us for once put our shoulder to the wheel and assist Mr. Sutton in carrying out his plan! I am sure it is kind of him to come forward and offer his services to us, and we ought to show, each and every man, a new lesson, to render his brother the best assistance he can. I think I am not asking too much. You will get more value than you send. Join us at once, and let us show to the world that we photographers can do good for one another, as well as other professions. Let every artist and amateur ask his friend; 'tis soon done, and we can then join in the achievement of Mr. Sutton's victory of giving us *never-fading positives on paper*.

"Old Erin."

MR. GODDARD'S LENSES.

The following letter is from a Cambridge M.A. No one can read Mr. Goddard's communications to the London Journal and the *Notes*, without being convinced that he is a man of great perseverance and good practical knowledge of his business. We insert the letter with much pleasure, and feel sure that in doing so our motive will not be misunderstood:—

To the Editor of Photographic Notes.

Sir,—In Vol. II, p. 126 of the Photographic Journal, is a letter from Mr. Brown, a well-known photographer of Newcastle, recommendatory of the Lenses made by Mr. T. Davidson, Optician, Castle Hill, Edinburgh. He there states "that he possesses a portrait-combination by this maker, the back lens of which is cemented, thus having the fewest reflecting surfaces a lens can have, and thus ensuring the least possible loss of light from reflection of surfaces. The outer lens is 14 in. focus, and the inner one 21-ins. The combined focus is 6½-inches, producing a half-sized picture. They can be reversed in the tube, and give a longer focus, thus producing a larger picture; or the 14-in. focus lens can be used for views, giving a well-covered field of 9 × 7. The lens of 21-ins. focus, when used for views, gives a picture of 15×12. Thus the lens has a four-fold use, each change working to the visual and actinic focus perfectly."

Being anxious to ascertain if Mr. Brown, after three years further experience of the working of this lens, still recommended it, I found on enquiry that he had laid it aside, and has for some time used a portrait combination made by Mr. Goddard, of Whitton, near Hounslow.

In a letter to that gentleman, dated 24th May, Mr. Brown writes as follows:—"In justice to Mr. Davidson, I must say that his lens was a very fine one, and I still believe that for groups, the close cemented-back lens is best. It has not the same amount of brilliant light as the open lens, yet it as decided advantages in my estimation, which the other does not possess, unless stopped down; for in lenses of all other makers (excepting yours) they are too central for any other purpose than a single portrait. With respect to the half-plate portrait combination I purchased of you, it cannot be over-rated by any praise I can bestow upon it. My knowledge of lenses extends to those of all makers of any note in England, France, and Germany, and I must say yours stands pre-eminently first for flatness of field and fine definition. I can copy any engraving with full aperture, every line correct to the corners of a 6½×4¾ plate, with a combined focal length of only seven inches."

To the above favourable testimony in favour of Mr. Goddard's Lenses, I can add my own, as I possess both his No. 3 and No. 4 combinations. The former will give good portraits to $8\frac{1}{2} \times 6\frac{1}{2}$, and the latter to 12×10 inches. The front lenses of these combinations are adapted for views, and give landscapes of 12 and 16 inches respectively, with good definition to the edges. I have therefore no hesitation in recommending them to the notice of photographers in search of a really efficient instrument, at a very moderate price, and with this view, I shall feel obliged by your insertion of this in your next number.

R. A. R.

London, 26th May.

ARCHER'S LENS *versus* THE ORTHOSCOPIC LENS.

To the Editor of Photographic Notes.

SIR,—A word or two in relation to the Orthoscopic lens. I have a double combination lens, made according to the formulæ of the late Mr. Scott Archer, 3-in, in diameter, $8\frac{3}{4}$-in, solar focus, covering a plate $9\frac{1}{2}$-in., price £6 6s. Mr. Archer took all his pictures with a similar one. He found it give the lines of architectural subjects without curvature. It is furnished with diaphragms for views, and is used without for portraits in the usual way. The front lens can be reversed, and used alone for views (having a focus of 15-ins.), but this is not recommended for architecture.

Knowing that it covered a large plate in comparison with the focus, I was curious to know what angle of view was comprised by it. Calculating from the supposed data, of a lens which covers a plate two-thirds of its focal length, including an angle of 35 degrees, I had concluded that one that covered more than half as much again as an ordinary lens, would include an angle more than half as large again, or more than $52\frac{1}{2}°$; but, on measuring carefully the angle actually included, I found it to be 45°. I consider that I am very fortunate in possessing an instrument which practically equals the Orthoscopic Lens, and at the same time can be used to take rapid portraits. The focus and field of the No. 6, ordinary Voigtlander combination, is much the same as the above, namely, 10-in. focus, and covers a 12-in. plate. The diameter and price do not correspond, they being respectively $4\frac{1}{2}$-in. and £45.

Mr. Archer, when he wished to lengthen the focus of his lens, used a diverging lens attached to the back lens. His views are very well worth inspecting.

W. EDW. HOLMER.

30, Upper Rosoman Street, London.

ARCHER'S LENS.

To the Editor of Photographic Notes.

SIR,—On inspecting this lens it appears to be of the usual construction of portrait lenses. Not being myself a judge, I have submitted it to a friend who has had considerable experience in a large optical warehouse, and he informs me that the lenses are of longer focus than usual. The front lens is a cemented plano-convex. The concavo-convex lens of the back combination is *more concave*, and the plano-convex, or back lens of all, is *less convex* than usual. The front lens reversed has a focus of 15-in. and the back lens about 30-in., and about 32-in., when reversed. In other respects it is the same as the ordinary portrait lenses, such, for instance, as those sold by Horne and Thornthwaite. The diameter is $2\frac{1}{2}$-ins. not 3-ins. as stated in my letter above. The distance between the lenses is 4-in. There is a permanent diaphragm between, and equi-distant from the front and back combinations, giving an aperture of 2-in. for portraits and 3 diaphrams for views of the respective aperture of three-eights, five-eights, and seven-eighths-of-an-inch. The exposure for a landscape with a five-eighth-of-an-inch aperture and moderate sunshine, is from seven to ten seconds. Portraits in the shade, with good light, about five seconds. I have very little time to experiment, but I will *endeavour* to take one or two negatives and submit them to you.

W. EDW. HOLMER.

30, Upper Rosoman Street, London, E.C.

"*J. T. Grazebrook*" complains of red skies in Calotype Negatives. We were once greatly troubled with red feeble Calotype. The remedy is to apply *gallic acid alone* almost as soon as the picture appears, and thus to prolong the development considerably. [ED. P. N.]

"*An Amateur, Isle of Wight.*" In the development of negatives with iron, there should be no free nitric acid in the nitrate bath. The nitrate of silver should be fused, and the bath rendered very slightly acid with ACETIC acid; or, if the nitrate of silver be not fused, the free nitric acid which it may contain should first be neutralised with carbonate of soda (not ammonia), and the bath then rendered faintly acid by the addition of ACETIC acid. In the development, the proportions of proto-sulphate of iron and acetic acid to the ounce of water will probably vary according to circumstances. We found it an excellent plan to add the acid to the iron solution in the measure, immediately before using it. We found also that when the developer was very strong it produced a light stain on that part of the plate on which the developer was first poured,—no matter how carefully and evenly this was done. This was probably owing to the excess of acid in the developer destroying the impression produced by light. We have succeeded in obtaining some very fine negatives by this method as described in No. 48.

Five grains of proto-sulphate of iron, and five minims of acetic acid to the ounce of *distilled* water appear to be the best proportions.

[ED. P. N.]

The "*Photographic Leopard*" in our last, writes to say that his spots were occasioned by using too strong a solution of cyanide of potassium. He is now using 10 grains to the ounce, and his spots have disappeared. We always use fresh cyanide, 5 grains to the ounce, for every picture.

[ED. P. N.]

☞ *The Communications of G. B.; J. L.; "Simonides"; "Old Photo"; H. K.; and H. H. C. will be given in our next.*

Photographic Notes.

JULY 1, 1858.

PRINTING IN CARBON, &c.

Our readers will find, on referring to p. 28, No. 48, of this Journal, the notice of a patent applied for on December 12th, 1857, by Mr. Charles Cowper, (No. 3,066), for certain "Improvements in Photography." This patent has at length been filed and completed, and the following is a copy of the Specification. The process is the invention of M. Testud de Beauregard :—

"Now know ye that I, the said Charles Cowper, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say :

"The invention relates to the production of photographic images, pictures, or proofs, without salts of silver. For this purpose, carbon, or other pigment is employed, and it is fixed on the paper, or other surface, by means of a preparation, which is acted upon by light.

"If gelatine or gum be added to a saturated solution of bi-chromate of potash or ammonia, and the mixture, after being dried, is exposed to solar light, the gelatine or gum is rendered insoluble in water. If, before exposing the mixture to light, an insoluble colouring material is added to it, such as carbon or black lead for a black colour; vermilion or carmine for a red colour; indigo for a blue colour, or other pigments or mixtures of pigments, the result is that when the mixture is exposed to light, and thus rendered insoluble, the colouring matter or pigment is imprisoned or retained by the mixture and rendered indelible. When such a preparation is exposed to light under a photographic negative or other transparent or partially transparent picture, and is afterwards washed with water, the pigment becomes fixed at those parts where the light acts upon it, but is removed by the water from the parts which are shielded from the light, so that the picture is reproduced in a similar manner to that in which pictures are reproduced by the ordinary photographic processes with chloride of silver. This mode of proceeding is not new, but in applying this principle in practice, there are certain difficulties to be overcome. Thus it is necessary to preserve the whiteness of the paper in the whites of the picture, and to prevent the adhesion or fixing of the pigment or colouring matter in the parts which have not been exposed to light, and also to employ the pigment in an extremely fine state of division; for in the ordinary photographic processes, the molecules of silver may be said to be in an infinitely fine state of division. It is also necessary that the particles of colouring matter should be spread as uniformly as possible upon the surface of the paper, and to give to the last operation of the washing, a liberty of action, such that the molecule or particle of pigment which is not fixed may not carry off with it, by its proximity or adherence, the neighbouring molecules which ought to be fixed by the action of the light.

"A saturated solution of bi-chromate of potash is heated in a water bath and a quantity of gelatine is dissolved in it. For one quart of the saturated solution of bi-chromate of potash, from one ounce and a half to three ounces and a quarter of gelatine may be employed, or in lieu of gelatine, from ten ounces to sixteen ounces of gum arabic, with a slight addition of albumen, may be employed. I do not however confine myself to the above-mentioned proportions, as they admit of considerable variation, according to the quality of the gelatine and the degree of sensitiveness required; a strong solution requiring less exposure to light than a weak one. The strength or density of the solution of chromo-gelatine should be such that it is syrupy at a temperature of one hundred and forty degrees of Fahrenheit's thermometer, and becomes solid or gelatinous when cold, and does not crystallize in cooling, and affords a film or thickness of the mixture on the surface of the paper immersed in it.

"This mixture or bath is used hot or warm, and the paper is either entirely immersed or floated on the surface. The immersion may vary from two to six minutes, according to the intensity of the light, and the season of the year. The more powerful the light, the stronger may be the solution, and the longer the immersion. The paper after removal from the bath is suspended in a hot and dry place until quite dry. All these operations must be performed in the dark or by artificial or yellow light.

"The carbon or other colouring matter or pigment, is now to be applied to the prepared paper. The colouring matter being insoluble the perfection and delicacy of the proof will depend on the application of the colouring matter in an extreme state of division. The preparation of the paper therefore consists of two operations; first the application of the chromo-gelatine to the paper, and second, the application of the colouring matter, not to the surface of the paper itself, but to the surface of the layer or film of chromo-gelatine on the paper, by which means the proof admits of being perfectly cleared or cleansed as herein-after described.

"The colouring matter may be applied in various ways, by the dry process, or by the greasy process, or by the wet process. By the dry process, the dry coated sheet of paper may be rubbed mechanically with the colouring matter spread upon a pad, or rubber of cloth, or leather. This method is particularly adapted to the application of plumbago or black lead. The operation is facilitated by moistening the rubber or pad with alcohol. The colouring matter ought to be spread as uniformly as possible. By the greasy process, carbon, or ivory black, or lamp black, or other suitable pigment is ground up very fine, with neat oil or other suitable oil, and applied to the coated paper by a pad or dabber. As soon as this mixture has been uniformly applied to the paper, it is immersed very quickly in a bath of sulphuric ether, either alone or with a slight addition of collodion. This last mixture has the effect of drying the paper or

removing the oil, and of causing the colouring matter to adhere to the surface. By the wet process, a bath is employed composed of carbon or Indian Ink, very finely ground with water and gelatine, and a small quantity of gum-arabic or dextrine. The coated paper may be immersed from ten minutes to three quarters of an hour in this bath, according to the thickness of the film or layer which is desired. This bath containing gelatine is employed warm or hot. A bath of Indian ink, with alcohol added to it, gives good results, when the paper is removed rather quickly from it. As in other photographic processes, practice and skill in manipulation enable the operator to obtain superior results. Mechanical means, such as presses or rollers, may be employed to facilitate the operations. Thus, the mixture of carbon and oil may be applied by inking rollers, instead of employing a dabber. As the object of the paper is to form a support for the chromo-gelatine, other materials or surfaces may be employed for this purpose. Glass, or collodionized glass, may thus be employed, and coated with the chromo-gelatine, and afterwards with the colouring matter, and thus transparent pictures and negatives may be produced; ivory, wood, and other materials may also be used in lieu of paper.

"The paper or other surface having been prepared in the dark, as above described, is then exposed to sunlight, or daylight, or other light of sufficient chemical power, either in the camera-obscura, or in contact with, or in close proximity to, a photographic negative, or other article to be reproduced, in the same manner that ordinary photographic paper is employed.

"The duration of the exposure to light varies with so many circumstances that no rule can be laid down; but it is easy to ascertain the necessary time by exposing pieces of the prepared paper to light for several different lengths of time, and noting which gives the best result.

"After exposure to light, the proof is fixed and cleared by simply washing it in hot water, either with or without friction, by a brush or sponge. The water dissolves out the gelatine or gum which has not been acted on by the light, and washes away the colouring matter from those parts which constitute the lights of the picture, while the parts which have been acted on by the light remain undissolved, and retain the carbon or colouring matter. The proof may thus be considered as an engraving produced by light, and not liable to be acted on, or faded by the agencies which injure ordinary photographs.

"A great variety of colouring matters, or mixtures of colouring matters, may be employed in the manner herein-before described. Gold and silver in the metallic state, and in impalpable powder, may be employed in the same manner. Various effects may also be produced by applying different colours to different parts of the paper or surface.

"It will be seen that the paper, or other surface, is always covered with a layer or film, on which the colouring matter is superposed and fixed. When the colouring matter is mixed with the chromo-gelatine, and applied at once to the paper, it is very difficult or impossible to wash it off so as to leave the lights of the picture clean and white. The application of the carbon or colouring matter by superposition in the manner herein-before described, is intended to obviate this defect.

"Having now described the nature of the invention communicated to me; and in what manner the same is to be performed, I wish it to be understood that what I claim is:

"The mode or modes herein-before described, of producing photographic proofs or pictures by means of carbon, or other colouring matter, applied by superposition, as herein-before described."

We need scarcely inform our readers that the process described in the above specification is not new to us, as we have, on several occasions, suggested in that Journal this mode of proceeding, at the same time observing that we have only partially succeeded with it. Mr. Pouncy, of Dorchester, is now spending a few days with us, and he emphatically states that his process is different from the above in some important particulars, and very superior to it. We have very little doubt of being able ultimately to arrange with him with respect to the publication of his process, but at present the number of names on the list for the purchase of it does not exceed five hundred. The specimens which Mr. Pouncy has brought with him are greatly superior to anything we have seen before of his, and we feel convinced now that the days of silver printing are numbered. We conjure our readers to come forward and assist us, without loss of time, in the purchase of the process. The importance of the matter cannot be over-rated. Beautiful prints may be produced in a variety of colours, precisely as we have all along predicted.

At a meeting of the French Academy of Sciences, on May 17th, M. Perin deposited a sealed packet containing the particulars of an economical process of producing Positive prints. At the last meeting of the Academy this packet was opened by M. Becquerel, and it appeared, from the contents, that M. Perin has substituted for nitrate of silver a substance extracted from the root of the purple "Goat's Beard," an esculent herb, which grows in damp meadows, and from the root of which a milky juice may be expressed. The packet contained three prints taken by the process described. MM. Becquerel and Segnier have been appointed to investigate and report upon the subject. As soon as further particulars are published we shall lay them before our readers.

Every photographer who has had any experience in positive printing must have suffered from the annoyance occasioned by excited chloride papers becoming discoloured

by keeping. It is customary to excite papers in the evening, in hopes of being able to use them on the following day,—the weather looks promising perhaps, and five or six dozen sheets are excited, and hung up to dry,—but next morning, perhaps, turns out cloudy or wet, and successful printing is impossible, so the papers are taken down and put away in a portfolio, there to remain until fine weather returns. Or, possibly, in this unsettled climate of ours, the glass may be low and the weather threatening in the evening, and no papers are prepared,—while the next day turns out all that could be desired for printing. These are among the drawbacks to the pleasures and profits of photography. Now an ingenious French gentleman, M. T. Cognacq, of La Rochelle, professes to have found a remedy for the evil. He has invented a box which can be closed air and light tight, and in which he says sensitive chloride papers may be preserved in all their original whiteness and purity for an *unlimited time;* and in proof of the assertion he offers to enclose any number of sensitive papers, marked in such a way as to be known again, and to produce them at any future time, when required, in their original good condition. This really appears to be a valuable invention, and if our readers wish to procure one of these magic boxes for the indefinite preservation of sensitive chloride papers, we refer them to M.M. L. and H. Wulff, 57, Rue Charlot, Paris, who are appointed agents for the sale of them. The price varies from 60 to 80 francs, according to the size. It will be understood that the papers are said to keep as well after exposure under the negative, as before, so that the operations of fixing and toning may be deferred "sine die."

M. Haudoy, of Lille, has introduced an improvement in the uranium printing process. The paper is first prepared with gelatine and nitrate of uranium, then dried, and exposed in the pressure frame, the time varying from 1 to 15 minutes; the picture, faintly visible, is then intensified or developed with aceto-nitrate of silver of the usual strength for paper negatives; in 30 or 40 seconds all the details should appear; the print is then placed upon the surface of the following bath:

Water	100 parts.
Proto-sulphate of iron	6 "
Acetic acid	4 "

This gives great vigour to the print, and brings it out upon the surface of the paper. The colour is then a deep sepia, but may be changed to a black by washing the print, and toning it with chloride of gold, strength, half-a-grain to the ounce of water. The iron bath is very energetic in its action, and the print must be watched when placed in it. Uranium prints developed with silver appear sunk in the paper, and look better by transparency, but by treating them with iron they are brought out upon the surface, and look better by reflected light.

The American Journals intimate a gradual return of public favour towards the much neglected Daguerreotype process. We are really glad to hear this. In our opinion there is no photographic process which for perfection of detail, exquisite gradation of shade, as well as for permanence, can be compared with that of Daguerre; and we were glad to see our opinion supported the other day by so distinguished a photographer as Mr. Williams, of Regent Street, to whom all the processes are equally familiar, and who is well qualified to decide upon their respective merits. In a letter to the "Athenæum," of April 24th, Mr. Williams says: "For astronomical observations, or for the recording of other instantaneous events, would you permit me to speak in favour of the Daguerreotype process in preference to all others. It is quite as sensitive, (I think more so), as the most delicate wet collodion plate; for sharpness and definition it stands unrivalled; and it will retain its exquisite sensitiveness, without deterioration, for twelve hours, or even longer." For our own part we appreciate highly, for their *artistic* merit, such works as those of Messrs. Rejlander, Fenton, Herbert Watkins, and Nadar, when printed upon *plain* paper; we appreciate also a really *good* glass positive, or a transparent positive upon glass, or positives upon porcelain or white enamel; but our highest admiration is reserved for a fine Daguerreotype. With respect to the ordinary run of positives upon albumenized paper we do not care about them; but our columns are open to all, and those who differ from us are at full liberty to express their opinion.

Some time ago Messrs. Colnaghi were permitted to offer for sale photographic prints from a negative portrait of the Royal Family. Messrs. Mayer, of Paris, have lately taken a stereoscopic portrait of the Emperor of the French, prints from the negative of which may be purchased of M. Gaudin, of Skinner Street.

Among the novelties introduced by the Trade, we observe that Messrs. Marion, of Regent Street, advertise visiting cards which bear a photographic portrait instead of an engraved name. The negative is to be taken by Mr. Herbert Watkins, and the price of these cards is to be half-a-guinea per

hundred. Also, Messrs. Saunders, of the Poultry, have started a circulating collection of stereoscopic subjects, subscription one guinea per annum. We wish all success to these spirited undertakings.

Mr. Gutch tells us that he is now using with great success citric acid instead of acetic in his developer, and that he finds Ponting's Collodion the *ne plus ultra* of good collodion.

Mr. Grubb, of Dublin, has patented a new view-lens. In its outward form it resembles the ordinary view-lens, that is to say, it is nearly plano-convex, with a stop in front, and the crown and flint lenses are cemented together; but the inner curve, instead of dividing the compound lens into a double concave of flint, and a double convex of crown glass, divides it into a meniscus of crown, and a concavo-convex of flint glass;—the crown lens being that on which the rays are incident. In this arrangement, as in the old form, the conditions of achromatism are satisfied, and the radius of the field is the same, but the new lens has less spherical aberration than the other, and is therefore, in an important particular, superior to it. It is not a little remarkable that the problem of the single achromatic view-lens should admit of *two*, and *only two*, solutions, and that the *worst* of the two should be that which has been adopted for a number of years. We have had our controversies with Mr. Grubb on some points of theory in optics, but in the matter of this new lens we fully appreciate the improvement which he has suggested. Unfortunately, however, it comes too late. The Orthoscopic lens of M. Petzval accomplishes what no single view-lens can do, viz.: it gives an image FREE FROM DISTORTION. The question between this and a single view-lens, of *any* form, is not one of rapidity of action, or size of the stop;—it lies far deeper, and is of far greater moment; it is a question of DISTORTION OF THE IMAGE,—of TRUE OR FALSE PERSPECTIVE. We cannot insist too strongly upon this. Photography fixes the images of the camera, but of what value is the process if those images are false and distorted? Photography then becomes merely the instrument of an untruth. The *first* consideration in investigating the merits of a lens is that of FREEDOM FROM DISTORTION. Now, in the single view-lens with a stop in front, the oblique pencils have great excentricity of incidence, and the distortion is very great, straight lines are curved inwards at their extremities, and the objects at the margin of the picture are diminished in size as compared with those in the centre. These evils exist to precisely the same extent in Mr. Grubb's new lens, as in the old one. We advise our readers therefore, to have nothing more to say to the single view-lens of any form, but to use the Orthoscopic lens, and that only, for views; and with respect to the size of the stop, we advise them on all occasions to use the smallest stop possible, because solarization is better avoided in this way, and a cleaner and better picture produced. Besides, with an exposure of three seconds, every moving figure produces a blur on the picture, while with an exposure of three minutes, a regiment of cavalry may gallop before the camera, and no effect be produced upon the picture. If a view cannot be taken instantaneously, it matters but little how *long* the exposure is, within a reasonable limit. A great deal too much is made of the comparative rapidity of processes, when absolute instantaneity of exposure is not achieved.

With respect to Mr. Grubb's patent, we believe it will not hold good. In No. 33 of this Journal, page 305, we have given the formula for a view-lens. It is immaterial in that formula, whether the crown or flint glass receives the incident rays, but when received upon the flint lens the formula gives the ordinary view lens,—when received upon the crown, the lens of Mr. Grubb. Both are included in that formula, *and it only admits of those two solutions.*

In a letter just received from Mr. Ross, he says, "with respect to my paper on the Petzval lens, I can only apply myself to it at leisure moments; but will do my best to let you have it for No. 55."

☞ We beg to inform our readers at Glasgow and the neighbourhood that our worthy agent, Mr. Spencer, has removed to No. 30, St. Enoch Square.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, May 17th, 1858.

Some large and fine prints, by M. Fierlants, of Brussels, were exhibited. They represent various views of the Park, and are as sharp at the edges as in the centre of the field. The negatives were taken with the Orthoscopic lens of M. Voigtlander.

M. JEANRENAUD exhibited some large and fine views of Dordrecht.

M. DE LA BLANCHERE exhibited some fine proofs obtained upon dry collodion in less than a minute and a half. The prints are said to have left "quelque chose à desirer."

M. QUINET exhibited a large negative, 25×20, taken on dry collodion, with a view-lens of 6-ft. focal length, and 6-ins. diameter. The time of exposure was only five minutes. This negative is a perfect success, and was considered very remarkable.

M. HOOEDÉ DU TREMBLAY, expressed his astonishment that so little notice had been taken in the Bulletin of the Society of the printing process with nitrate of uranium. He suggested that a committee should be at once appointed to examine and report upon this process. M. Perrier seconded the motion, and proposed the nomination of a committee, to consist of MM. Balard, Bayard, Perrier, Davanne, and Girard.

After the discussion which ensued, some uranium prints, by the improved process of M. Haudoy, of Lille, were exhibited by M. Delahaye. These prints were pronounced equal in all respects to those by the ordinary processes.

[See our remarks on M. Haudoy's process in the Leader. We have experimented considerably with the uranium process of printing and toning with gold. The prints appear to be permanent, as they resist the action of destructive tests far better than ordinary prints, but their colour is intensely blue and inky, and they appear dead and sunk in the paper. These defects are fatal to the general adoption of the process. M. Haudoy's treatment with iron appears, however, to obviate these objections. We shall try it shortly, and report results.—ED. P. N.]

MACCLESFIELD PHOTOGRAPHIC SOCIETY.

At a numerously attended Meeting of the above Society, held on June 2nd, the following paper was read by Mr. W. B. Osborn, Treasurer of the Birmingham Photographic Society:—

THE DRY COLLODION PROCESS.

Mr. Chairman and Gentlemen,

Feeling duly impressed with the honour you have done me, in requesting me to read a paper before you this evening, an honour the more prized because bestowed at the opening Meeting of your Society, thus giving me an opportunity of making your acquaintance at an early period of your history as a Society, and enabling me, I trust, to be of service to you in giving you the result of my experience in a very delightful branch of the fascinating art, of which we are all disciples.

The Process which your Secretary has kindly pointed out to me, as likely to prove of interest to you, is fortunately a process to which I have devoted considerable care and attention during the past year; and, from a series of careful experiments, I feel convinced that it is at once of high utility to all classes of Photographers, and that Dr. Hill Norris's Process, (the one I am about to introduce to your notice), is the simplest, cleanest, and most successful Dry Process now extant. To this gentleman is due a very large amount of praise, for the liberal manner in which he has given the results of his arduous labours to the world; and I shall endeavour this evening to explain the *modus operandi* of this exceedingly useful adaptation.

The advantages of this process will be obvious to all who have ever worked collodion in the open air. The perfect freedom of action is a great charm to any one who has been tortured with the portable and convenient tents, so light that one person *may* carry them while it inevitably requires another person to carry the remainder of the apparatus, so that extreme portability is not attained in this way. I have tried all ways, full tents, demi-tents, &c., &c., and had I not been enthusiastic in the pursuit of Photography under difficulties I should long since have given up out-door Photography as hopeless. The stifling sensation of a tent on a hot summer's day are anything but pleasant. Besides, I was quite disgusted on one of my excursions with a tent, by the advent of a crowd of urchins running after what they were *pleased to call* the *Punch and Judy man.* I next tried the manufacture of a portable developing Box, and in this I flatter myself I was tolerably successful, because I could carry all I wanted myself. However, this soon became a bore, and, altho' the box is light, the whole of the apparatus is heavy, so after many trials I took to the Dry Process.

I shall of course presume that you are all acquainted with the Wet Negative Collodion Process, so that I shall spare some of the details that I might feel bound to give to mere tyros in the Art.

With your permission we will just glance at the *rationale* of this Process.

I might here suggest that if Amateur Photographers would as a rule, examine the *rationale* of any new processes submitted to their notice, and convince themselves that they were based on really correct and scientific principles, before venturing upon actual experiment, they would save themselves much time and trouble as well as unnecessary expense. A great number of the formulæ often published in the pages of the Journals are empirical and useless, and when tried can only end in disappointment and failure.

The manipulation of Dr. Norris's Dry Process may be said to consist of 9 distinct operations, viz.

1. Selecting and Cleaning the Plates. 2. Coating with Collodion. 3. Exciting. 4. Washing. 5. Pouring on the Preservative Solution. 6. Drying. 7. Exposing. 8. Developing. 9. Fixing. Being only three operations more than in the wet process.

First then, the Collodion.—You are all probably aware that various samples of Pyroxyline possess very different characteristics; some kinds are highly explosive; others are simply combustible, while others again are not explosive, and are only slowly combustible. This difference is carried out in the manufacture of collodion, some kinds being only sparingly soluble in ether, while others are abundantly so. Again, some kinds yield a fine thin glassy film; some a hard, horny, and strongly contractible film; and others a porous non-contractible and structureless film. It is this last kind—the powdery or porous sort—which is best adapted for the purposes of Dry Collodion. New Collodion, as a rule (except when made in the way

I shall describe), is highly contractible and is very easily washed off the glass. The wavy lines so often seen in some collodionpictures are doubtless due to the contraction of the skin-like collodion when drying.

Collodion, when it has been kept some time, undergoes a change, and becomes porous and fit for using for dry purposes. This is generally the case, but not always, and those of you who have a stock of old collodion will be in a very good position to experiment with the process now before you. You may easily test any collodion by manipulating in the ordinary way, finishing, and washing; if, upon passing the finger across the film while wet it follows it like a piece of skin, and will allow of being nearly restored to its original position, *it will not do* for the purpose; but, if on the contrary, it crumbles up into a powder, and remains so, then it is quite fit for use.

Another method of testing is to pour a small quantity of the collodion into a glass of water. If the residue is stringy it will not do, but if powdery it will answer the purpose.

To make collodion *new* and fit for dry operations, great care has to be taken in the strength and temperature of the mixed acids in making the pyroxyline. The difference between a high and low temperature being very remarkable. The proper strength of the acids will of course vary in the different samples, but a good rule is to procure the strongest acids, and when mixed, add a portion of water, and raise the temperature to between 130° and 170° Fahrenheit. This will give you a fluid porous collodion, if mixed in the usual way with ether and alcohol.

I never recommend amateurs to meddle with making pyroxyline; it is a very uncertain thing and requires great experience. The collodion may be mixed as follows :—

Soluble cotton (as above)..	6 to 8 grains.
Rectified ether.......... ..	6 drachms.
Alcohol absolute..........	2 ,,
Iodide cadmium...........	6 grains.

Let it stand for a few days to settle. It improves with keeping.

The bath is the ordinary 30-grain nitrate of silver to the ounce, saturated with iodide of silver, and slightly, but *very slightly* acid.

The preservative solution is made by dissolving 80 grains of pure gelatine in 20 ozs. of boiling distilled water. Filter while hot through two thicknesses of bibulous paper. Then carefully boil down to half the quantity, stirring with a glass rod; when cooled put it into a bottle with 1½-ozs. alcohol, and shake it. It should be as clear as water.

We shall now proceed to work, selecting and cleaning the glass plate.—The flatted *crown* glass is what I generally choose; it is nearly as good as patent plate. Take a file and run along the edges to prevent cutting the hands; then, with a Buckle's brush, dipped in nitric acid, rub over the plates on both sides; wash well in water and polish off with dry cloths and wash-leather. *Never use silk* handkerchiefs.

2. Collodionising the plates is accomplished in the ordinary way; so is 3. Exciting in the nitrate bath. We then arrive at an important operation.

4. Washing the free nitrate off. Upon taking the plate out of the bath drain upon blotting paper, and place the plate in a vessel of distilled or very pure filtered rain water; this should be collected in a vessel kept for the purpose—immediately after the first fall of rain—and not taken out of the water but, as it would most probably contain organic matter, which would injure the purity of the iodide of silver.

After the plate has remained a few minutes in the first dish of water, lift it out and place it in a second, then in a third, and lastly in a fourth dish; let it remain in each dish for two minutes. Repeat the operation with each plate successively and change the water for every three or four plates.

It is very essential that the free nitrate of silver in the film should be nearly all washed off, or at least reduced to the minimum, otherwise, should any remain, the plates will not keep so well, and are very likely to stain during development.

After slightly draining they are ready for the (5.) Preservative solution. Place the bottle containing this in a saucepan or jug of boiling water. When hot, take the plate in the left hand, and pour out sufficient of the solution to cover the plate evenly. The operation is precisely similar to the coating with Collodion, only that in this you pour on at one of the corners and slightly tilt the plate. In half-a-minute pour this off and give a second dose, beginning at the opposite end of the plate. The plate may now be drained and either allowed to dry spontaneously or submitted to

6. The Drying operation.—This should be conducted in a box somewhat like the sketch. The plates are reared up, (faces under), against the partitions, and a spirit-lamp, lighted underneath the box I use, is made of tin, with sliding wooden frames. When dry the Plates may be kept an indefinite time.

7. Exposure.—On this point, it is impossible to give any definite instructions. As a rule, I think it is about four times as slow, as moderately sensitive wet collodion. I have taken good pictures with Ross's Stereoscopic lens, 4½-ins. focus; ⅛-ins. aperture; bright sunlight, 2½ to 3 minutes; dull weather, 5 to 15 minutes; the last were overdone.

8. Development.—Immerse the plate in a dish of *distilled water* to soften the gelatine; and, for stereoscopic plates, pour over 1 drachm of the following solution, mixed with 3 drops of nitrate of silver, 40 grains to the ounce :—

Pyrogallic acid........	3 grains.
Distilled water........	2 ounces.
Glacial acetic acid.....	1 drachm.

Citric acid, 2 grains, may be substituted for the glacial acetic acid. The development will proceed very rapidly and produce very intense pictures. Should the solution become muddy, wash off and proceed as before, using rather more silver.

Printing Transparencies is accomplished by placing a negative and a prepared plate in contact and exposing to gas-light for five minutes, diffused daylight for about three to five seconds; they are then developed in the ordinary way. I shall now proceed to develop some transparencies exposed last week.

For developing large plates a safer method is to use a saturated solution of gallic acid, to every ounce of which add 10 drops of the nitrate of silver, as above. The temperature of the room should be about 70° and the development will occupy from one to two hours.

9. Fixing.—This operation may be performed as in the wet process, with cyanide of potassium; this is preferable to the hypo-sulphite of soda, which requires so much washing. The plate may now be varnished and the process is complete.

In conclusion, I can confidently recommend this process; it is simple, easy, expeditious, and is well worthy your notice and trial. It requires a little care at first and then all is comparatively easy.

May I hope that I have done you some little service this evening, and that I have imparted some information that is new to you; if I have done so, and have thereby contributed to your gratification and the advancement of our art, my object is accomplished.

On Mr. Osborne's resuming his seat a vote of thanks, proposed by Mr. Stewart, was carried with acclamation.

Mr. Jesper also begged to thank the Birmingham Society, through Mr. Osborn, for the kind assistance afforded in the formation of the Society.

Mr. Osborne returned thanks in an appropriate speech and the proceedings terminated.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

MR. POUNCY'S PROCESS.

To the Editor of Photographic Notes.

Sir,—I, as an old professional photographer, have long wished for a method of printing photographs, that would enable me to say to my customers, (without making my conscience wince) "this will be a dear relic of your old father for your children to look upon!"

The above desire made me call upon Mr. Pouncy, the inventor of the Carbon Process, to carefully examine his productions.

I found him an intelligent man, of quick nervous temperament, very kind and free, with a mixture of love of approbation and a little caution. He has spent much time and money in the development of this new Carbon Process. The prints astonished me; they far exceeded my expectation. The minute detail is hardly so finely rendered as by the common method, but the process is yet in swaddling bands. Mr. Pouncy gave me a few prints; I have shown them to many scientific photographers, who all wonder that the Photographic Journal should use its little influence to throw cold water upon, (in my opinion), the only real discovery in art since the application of collodion. If Mr. Pouncy's Process could be brought out, and improved *only a little* it would give an impetus to the sale of photographic productions hitherto unknown.

Photography and art, which are only courting each other now, would then become wedded altogether, and large landscape photographs, by a process of colouring adopted by Mr. Elliot of Taunton, will be rendered not much inferior to some of Gainsboro's best works. One word more, in conclusion, on portraiture. Mr. Pouncy's Process is already perfect for that purpose. I saw many prints in fit order for the pencil to work into beautiful works of art. I examined Mr. Pouncy's negatives, and found them all inferior, less or more, and I believe, that with good negatives, capital impressions will be got for the pencil. *If need be, I can prove* the pencil to be absolutely necessary to the production of a correct resemblance of nature in portraiture. I now conclude my note by thanking you Sir, for your bold and sensible method of trying to buy Mr. Pouncy's Process, and I strongly advise all those who are wishful to make permanent portraits that will bear *refined* criticism and a little breath of time, to assist you in this worthy speculation.

I have been induced to write the above letter, which you can use at your discretion, by reading the unjust, and very unphilosophical criticism in the Photographic Journal.

John Beattie.

Portrait Rooms, Triangle, Bristol,
June 14th, 1858.

THE BRUSSELS EXHIBITION.

To the Editor of Photographic Notes.

Dear Sir,—Some time ago I read in the *Notes* that I was among the fortunates who received a Medal at the last Brussels Exhibition. I have reason to believe it was a mistake. But it was no mistake that I had to pay more than a Pound to get my plates returned—in spite of the promise given that I should be free of expenses.

Yours very truly,
O. G. Rejlander.

Wolverhampton, June 12th, 1858.

DRY COLLODION PROCESS.

To the Editor of Photographic Notes.

Dear Sir,—Some twelve months since, while experimenting on Dr. Taupenot's process, a modification of it occurred to me, which I have found to answer remarkably well; but I did not think it of sufficient importance to make public. I have always been averse to that rage for immediate publication which seems to have seized photographic amateurs. It is the cause of an immense amount of mischief, as the process (or modification merely as too many are,) is published in a crude form; frequently the result of some accidental state of the ingredients employed, and found eventually to be a mare's nest and not the great discovery which the amateur at first fondly imagined it to be; your own experience must tell you that my remark will apply to the great majority of cases; in what other way can we account for the many photographic bubbles which rise, sparkle for a moment, and are sunk in oblivion. Let anyone who doubts what I say, if he has a half-hour to spare, take up the back numbers of the Photographic Journal, and, commencing at No. 1, go through the volumes, and see how many of the various processes there mentioned are in existence at the present moment. Alas! they are few; of course I do not say all are so, on the contrary, there are some gentlemen to

whom our warmest thanks are due for the freedom with which their discoveries are given to the public; these are, in nearly all cases, the result of study and experiment, and herein lies the difference between these and the hasty invention I have condemned; many of the latter have written in the height of enthusiasm, before time had been allowed for cool reflection, when the heart of the amateur was beating high with the proud thought that he *too* should appear *in print* as the discoverer of the simple process, which in his sanguine imagination has already swamped all the old and clumsy methods, and has taken a first place in the annals of Photography; whilst *he*, the inventor, is written to, talked about, his name constantly before the public, as amateur after amateur bears testimony,—"through the medium of your excellent Journal,"—to the practical utility of the discovery or modification, whatever it may be. (Though this may be called a little flight of imagination, yet it is very evident from the style and manner of many of these letters to editors, that such were the feelings under which the writers laboured when their communications were penned). Where is the process now? Have the inventor's high anticipations been realized? I fear not, the probability is, that after the first appearance of his article in the Journal, it is heard of no more, unless some fickle photographer should try it, and write to the much enduring editor an account of the manner in which "his plate blackened under the influence of the developer," or "the film rose up in blisters and then slipped off the plate." We hear of no more after this, even from the inventor, who often finds himself unable to produce the same results on his next attempt, and in his inmost heart feels ashamed of his precipitation, and resolves in future to see that his ship is fairly ready for sea before he knocks away her support and launches her on the public; but to return: I began by saying "Some twelve months since, &c." You had better read it again, as my long digression will have caused you to forget it, while I go on thus: This process, I find essentially the same in principle as the one Mr. Fothergill inserted in the "Times," some short while since, and a communication respecting which is in the last number of your Journal. I have not written to you to set up my first claim to the discovery, (if discovery it be); but firstly, for my own amusement, and possibly some of your readers; and secondly, to mention the method I have subsequently followed as giving better results than the one I first employed. This was identical with Mr. Fothergill's, excepting that I used gelatine instead of albumen.

The plan I afterwards followed is rather more troublesome, but I think more certain, and less dependent on the state of the collodion film: this is of great advantage to many new beginners, who in almost all cases prefer the collodio-albumen process to the gelatine; the latter being in a great measure dependent for its success on the collodion employed. The process is as follows: After sensitizing, the plate must be coated with albumen, but *iodized*, (not plain, as in Mr. Fothergill's method), allow it to rest a moment and then wash well under a tap until all the albumen is washed off and nothing remains but what is lodged in the pores of the collodion. After this, it must be dipped a *second* time in the same silver bath, washed and dried. I may mention, that after the albumen has been washed off, the plate may be immersed while still wet; but when time is not an object the results will be found better if the plate be allowed to dry previously. This latter method was suggested by my friend Mr. Hooper, of Manchester, who has worked the process as well as myself, for some time, and can speak to its good results. As regards sensitiveness, I do not think it has much advantage over the ordinary collodio-albumen process; it is, however, much quicker in development, and this, at first, led me to believe that I had hit on a more sensitive process; subsequent experiments, however, showed, that to procure *good half-tones*, the exposure required was nearly the same as by the old method. The development is conducted in the usual manner, either with gallic or pyro-gallic acid, as may be thought most suitable. If this modification is of any use to your readers they are quite welcome to it. I never thought it worth while publishing before; but seeing that the new process was occupying a good deal of public attention, I thought I might as well mention my new experiments in that direction.

Bradford. "OLD PHOTO."

—In reply to the query contained in your postcript, please consult Mr. Howlett's letter on taking Instantaneous Pictures, in *Notes* No. 42. [ED. P. N.]

FOGGING OF COLLODION POSITIVES.

To the Editor of Photographic Notes.

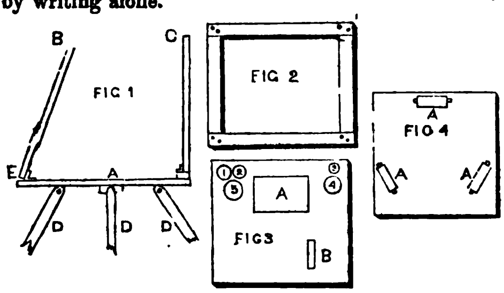
SIR,—Amongst the numerous causes of fogging of Positive Collodion Plates, I have not seen mentioned one which caused me much trouble and expense. It was some proto-sulphate of iron I had by me for some time. It had become slightly *lighter* in colour but did not show any of the yellow colour which proves it to be useless to the Photographer. In the course of my experiments to discover the cause, I tried every remedy suggested in your publication, without effect, but upon trying a fresh sample of Iron my plate became as free from fogging as possible. I send this note, hoping that you will mention the matter in your *Notes* and thus perhaps save others from the trouble and vexation caused by repeated failures; more especially as Iron is now coming into use as a developer for negatives. J. L.

SUBSTITUTE FOR A TENT.

To the Editor of Photographic Notes.

SIR,—Knowing that your journal is always open to any little improvement in Photography, I am encouraged to trouble you with a few lines on what I hope you think is worthy of such an appellation, and if you deem the substance worthy of a place in the *Notes*, I shall feel much gratified by its insertion, and by the hope that other operators may receive the same amount of benefit in the shape of convenience that I have from the use of the

contrivance. I am only a beginner in the art, but have been so often disappointed in the results of dry plates for "out-of-door" work, that I am determined to use the wet collodion process at all hazards, and not liking the idea of taking a cumbrous tent with me everywhere, and being constantly employed in pitching and removing it, it struck me that a very light and portable affair might be made on the principle of a dark chamber or box, only admitting the head and hands of the operator. I have constructed such a one, at a small expense, extremely portable, and I find that I can work in it with all the ease and certainty (after a little practice) of my dark room. I enclose you some small drawings of the different parts to explain the construction more fully than I can do by writing alone.



The principle is a dark chamber, the bottom board of which A (fig. 1), is 15 × 18-ins., and three-eights-of-an-inch thick, and is supported upon a light tripod stand D D D to a convenient height (about the height of the breast of the operator). The side B is an open framework (like fig. 2) and is hinged upon the edge of the bottom board A at E, so that it may stand perpendicularly to it, or fall flat upon it, when packed up. The side C is of the same construction, but is hinged upon an extra strip of wood placed upon A, to allow for its falling in turn flat upon B. Each of these three parts are composed of mahogany, three-eights-of-an-inch thick, forming, when folded up, a light article, 1½-ins. thick. To support the side frames when open, I place the light slabs of the same wood across the top from B to C, keeping them perpendicular. This framework is covered at the sides and top with two folds of black calico, or other material, impervious to light, and lined or covered wiih yellow calico, to make it the more certainly light-proof; the front, or end of the chamber furthest from the operator when set up, is covered with four folds of yellow calico, having two other loose folds attached to the upper edge, to raise or lower at pleasure, to regulate the amount of light inside. These coverings are well sewn together round the edges, and when the framework is let down flat, they also fall, and can be nicely folded and strapped down upon them.

The back of the chamber, (or end nearest to the operator) is quite open, but the black covering of top and sides is extended backwards, so as to cover the head of the operator, in the same way as a focusing cloth, and by a string and string case at its extreme edge, can be carefully and conveniently drawn tight round the neck of the operator, *by himself*, and fastened with a bow knot, he thus having his head inside the dark chamber, with considerable freedom of motion, and the yellow calico in front of him, giving light to work by. The hands are then introduced at the sides, by holes in the black covering, having sleeves, with elastic bands round the wrists, thus giving freedom of motion, without admitting the light. The internal arrangements are equally simple. Fig. 3 represents the bottom board, which rests on the tripod stand. A is a small gutta-percha slop tray, with an escape pipe at one corner to allow the refuse liquid to escape during the developing. B is a hole cut into the board to admit the nitrate bath (my bath is one for stereoscopic plates), and has a pocket attached to keep the light from entering round the sides of the bath. C is the supposed position of the body of the operator. I found, by experience, that these positions of slop-tray and bath are the most convenient. I place my bottles of collodion, nitrate of silver, cyanide of potassium, developing glass, and a mug of water, in the two corners furthest from me, in the places occupied by the circles 1 2 3 4 5.

Fig. 4 shows the other side of the bottom board, having the pieces of wood attached, A A A, upon which the legs of the tripod stand are fitted, the large circle upon which they are placed giving great solidity to the apparatus during the process of manipulation, and also abundant resistance against gusts of wind.

In manipulating, I place my collodion bottle, clean plate, and camera-back inside, the bath being in the hole made for it; I then draw the string tight round my neck and fasten it, insert my hands at the arm-holes in the sides, and proceed to collodionize and sensitize the plate, by the yellow light through the front of the chamber, and having placed it in the camera-back, I let myself out of the chamber, leaving the back of it open. Having exposed the plate in the camera, I place the holder inside, and having put the developing solution, nitrate bottle, cyanide, and a pint gutta-percha mug of water inside, in convenient places, to take hold of them as wanted, I re-enter the concern as before, and proceed to develop in the usual way, as in a dark room.

In moving from place to place I do not take the chamber to pieces, but, by detaching the legs of the tripod stand, I hang it over my shoulder by the remaining one, and so carry it about all day long, the weight being a mere nothing. When packed up it goes edgeways into a flag basket, 16 × 50-ins. and 3-ins. wide, in which I carry my plates, chemicals, &c. &c.

In conclusion, I assure you that in practice it answers admirably, and I shall never try dry plates again as long as I can find a convenient place to set up my tripod stand near my camera.

I send you a stereoscopic print of the apparatus, with a person in the act of using it, that you may better understand the exterior arrangement, and I hope you will be able to make out its construction, despite my imperfect power of description. I feel sure that every photographer would like the plan if once he tried it. G. B.

Leicester, May, 1858.

DISTILLED WATER.

To the Editor of Photographic Notes.

SIR,—Will you please to inform me if condensed steam water, collected from a steam boiler, kept purposely for steaming prints at a calico printer's establishment, will not answer every purpose for photography as effectually as water distilled over a common fire. In such a boiler there is nothing introduced for cleaning the boiler, as there is in common steam boilers, as they are obliged to be very particular or they might damage the colours of the prints.

I believe it is customary for some photographers to use water condensed from somewhere near the mercurial tube; can you inform me if there is any advantage in this over water condensed from cylinders heated for the purpose of drying yarns in cotton mills.

An early answer to the above will save an expense either in wasted material or purchase of distilled water, to one who would practice a

DRY PROCESS.

—If the steam is free from other volatile matter it does not signify from what source it is obtained. Distilled or rain water should not be collected in leaden vessels, or passed through leaden pipes, because the lead is oxydized by the air contained in the water, and the water dissolves a small quantity of oxide of lead, which fogs the plate if used in the nitrate bath. The objection does not apply with equal force to spring or rain water, as these contain salts which form an insoluble precipitate upon the surface of the lead, and thereby protect it from oxydation. Filtered rain water from leaden tanks is sometimes sold for distilled water. Lead may be detected by sulphuric acid, which causes a white cloudiness in the water containing it,—or by iodide of potassium, which produces a yellow turbidity due to iodide of lead,—or by hydro-sulphate of ammonia, which produces a black tinge from sulphide of lead. [ED P. N.]

To the Editor of Photographic Notes.

SIR,—Can you give me a formula for a positive developer that will produce the lights of a rich *cream* colour. I have seen several portraits, the ground of which has been exactly the colour of rich cream, and when the portrait is coloured, produce a nice effect.

In attempting to develop negatives with gallic acid, I find the picture comes the instant the gallic acid is poured on, and does not admit of being strengthened by the acetate of lead, the picture remaining very feeble and green by transmitted light. Can you tell me where I am at fault? I have adhered strictly to the directions in the *Notes.*

W. SPRING.

—Perhaps some of our correspondents can answer your first query.

With respect to the second, there was not enough acid in your film. Your nitrate bath was probably alkaline; add a little acetic acid to it. Gallic acid alone should not develop the picture, or produce any visible effect for several minutes.

[ED. P. N.]

ACHROMATICITY OF LENSES.

"*Simonides,*" enquires how opticians test the achromaticity of their lenses. We put this query to Mr. Goddard, and received the following reply:—

"The achromaticity of the object-glass of a telescope is easily examined by directing the telescope to a bright star. If the telescope is under-corrected for colour, and the eye-piece is pushed in a little nearer the object-glass than distinct vision, the spectrum of the star is surrounded by deep red, and on pulling the power outside distinct vision, the image is surrounded by blue; but, on the contrary, if the telescope is over-corrected for colour, on pushing in the power, the image is surrounded by light blue, and on drawing out, the spectra is surrounded by yellowish orange. The colour cannot be entirely corrected in the usual object glasses, and the residue of colour that is sometimes called the secondary or irrational spectrum, assumes slightly different tints, according to the sort of glass composing the object-glass; for instance, a very fine triple achromatic objective, composed of Chance's white crown glass, Chance's dense flint, and English plate, showed no discernible colour outside the focus, and a very faint trace of unobtrusive purple inside the focus—but other good double and triple object-glasses, differently composed, may, and do have, their maximum correction with a slightly different tint, and it's rather a matter of fancy to dictate a standard of perfection in this respeet."

—The achromaticity of a photographic lens may be tested by darkening the room, and directing it towards the flame of a candle. The image, when examined by a telescopic eye-piece, should be nearly free from colour. When the orange and blueish-green colours are combined, the yellow and violet would be also combined, were it not for the irrationality of dispersion. Opticians do not in general test their photographic lenses by actual photography, but in the manner described. The mode is sufficiently accurate in practice.

[ED. P. N.]

DARK ROOM AGAIN—LEMON-YELLOW.

(Extract from Humphrey's Journal.)

"By your letter to me I judge that some of your readers are at a loss to know what I meant by *lemon-yellow*, in contra-distinction to *orange-yellow* paper. Now, if there are any others in such a quandary, I advise them to take a peep at a basket of fresh lemons and oranges at the same time. The lemon-yellow is purely yellow, and will apparently let through as much light as though the paper were white. This light has no chemical affinity for iodide of silver. On the contrary, orange-yellow has a certain admixture of red with the yellow. The room would require to be much darker, (if the orange colour were used), to prevent the fogging of the plate, as the red rays have more chemical affinity for iodide of silver than the yellow.

"Not long since a neighbouring artist paid me a visit, and I took him into the chemical room to see me develop a picture. As soon as he entered the room he exclaimed: "Why, how light it is! you don't develop here?" I proceeded, however, with all deliberation to remove the glass from the holder, and, after examining it to see if there were any defects in the film, I applied the developer. When

the operation was completed he remarked: "Well, this beats me! here I have been working in the dark at random, while your room is as light as all out-doors. Why didn't you tell me this before?" I replied: "If you had taken as many different Photographic journals as I do, and carefully studied as many works on Photography, you would probably have arrived at the same result, as the principle was published in England more than two years ago. All the credit I claim is having *paid the printer for the journal* in which I found the fact stated.

"I know of artists who would be willing to pay me fifty dollars if they could be sure to obtain some wonderful secret, which they suppose I possess, of mixing my chemicals. If these same men had paid one quarter of that sum for photographic publications, and then exercised a commendable degree of industry and zeal to improve on the knowledge thus obtained, they would not suppose that I possessed any unusual amount of magic. Such men, who will not take the journals because they *cost so much*, are always from two to ten years behind the times, and at last they pay higher for what little they know than any other class of men.

"In using the yellow paper it may sometimes be necessary to use more than one thickness over the window. Any operator can tell, by trying, what amount is necessary.

"F. B. GAGE."

"*H. K.*" We cannot answer your first query, but advise you to use distilled water, and fresh chemicals; then, when the chemicals are proved to be good, go back to the rain water and try it again. See to the tank and pipes; salts of lead would decompose the developer very rapidly.

The chloride of silver thrown down by salt from a solution of silver coins in nitric acid, is pure, but should be thoroughly washed in many waters before reducing it. Reduction by a zinc bar is not a safe plan, because zinc is generally contaminated with iron. The best plan of reducing the chloride is to fuse it with carbonate of soda in a crucible, and get metallic silver. An acid bath may be neutralized with carbonate of potass, or soda,—these fixed alkalies are better than ammonia.

Chloride of silver may be reduced by boiling it with caustic potass and grape sugar. Brass may be plated by rubbing it with chloride of silver.

[ED. P. N.]

"*H. H. C.*"—As you observe, the time of exposure varies greatly with the lens and diaphram,—with the condition of the chemicals,—time of year, &c. For instance, the other day we were taking views 9×7 with wet collodion. To some objects we gave 10 seconds, to others 3 minutes,—and all the negatives were good of their kind; the lens was 15-ins. focus, and a ½-inch diaphram used in every case; and the time between 10 a.m. and 1 p.m.

A great deal of nonsense is talked in the Journals about the time of exposure. The only way to arrive at a true notion of the comparative sensitiveness of different processes is to study the theory of the subject. [ED. P. N.]

"*Votre bon ami.*" Apply to Dr. Hill Norris for information.

[ED. P. N.]

☞ *The Communications of "J. Brown"; "D. K. W"; "P. G. Kleffel"; "Stereoscopic"; "Photo"; W. Spring; will be given in our next.*

Photographic Notes.

JULY 15, 1858.

Our next Number will be ENLARGED *to 24 pages, on account of the increase in the space occupied by Advertisements. Should this state of things continue, the Journal will be* PERMANENTLY ENLARGED *to 24 pages.*

We have been endeavouring, as our readers are aware, to purchase of Mr. Pouncy his process of Printing in Carbon, so that the particulars might be published in a shilling pamphlet. He required £100 for the process, and we offered to pay for the printing and take all the trouble of distributing an edition of the pamphlet consisting of 2000 copies, if 1000 copies only were previously ordered by subscribers; holding ourselves answerable to Mr. Pouncy for the entire £100. The Subscription List has now been open for six weeks, and we have exhausted our powers of persuasion to induce our readers to come gallantly forward and add their names to it. The result is that only about 600 copies have been ordered. So far therefore our project has failed. But we are not among those who would "lose the ship for a ha'p'orth of tar," and when Mr. Pouncy was on a visit to us a few days since, we paid him £50 for his process, according to the terms of the following agreement; from which subscribers to the intended pamphlet will see that Mr. Pouncy was anxious to express his sense of their liberality, as compared with that of others. The agreement was hastily got up and signed. It will not perhaps bear strict criticism, but would have been binding between men who intended to act honestly by each other. It runs thus,—

"John Pouncy agrees to communicate to Thomas Sutton the particulars of his process of Printing Photographs in Carbon. Five hundred copies of the process are to be printed at Thomas Sutton's expense. These are to be sold as follows:—a certain number to Subscribers(*) at the sum subscribed,—the remainder at One Guinea each. All the proceeds above £50 to go to John Pouncy. Should the entire proceeds exceed one hundred guineas, John Pouncy is to pay for the printing of the pamphlets, envelopes, &c."

(*) Although about 600 copies were ordered, there are not more than 300 names on the list. According to the agreement, each Subscriber was to have *one* copy, and a licence to practise the process, either professionally or otherwise under Mr. Pouncy's patent.

Although not mentioned in the agreement, the guinea was to include *a licence to practise* the process under Mr. Pouncy's patent; so that many subscribers would receive the pamphlet, and a licence to practise the process, for one shilling!

The agreement was signed by both parties, and its conditions fulfilled by us, so far as the payment of the £50 was concerned. It then remained for Mr. Pouncy to communicate his secret. This he had come to Jersey prepared to do, and had brought the materials with him. The process was therefore gone through from beginning to end, and a carbon print produced in our own presence, from one of our own negatives (albumen on glass). We are now therefore in possession of his secret; and since his departure have successfully repeated the process.

And now comes the sequel. The agreement was drawn up, it will be remembered, before we knew the process; but as soon as we became acquainted with it we thought it right to advise Mr. Pouncy not to issue licences to practise it under his patent, as it might involve him in litigation, for there already exist two patents for printing in carbon and pigments, one given in our last number, and just completed,—the other, completed by M. Poitevin on June 7th, 1856. The latter includes two processes, one for Photo-lithography, the other for printing in the following manner;—we quote from M. Poitevin's Specification:—

"I apply various liquid and solid colours upon paper, cloth, glass, and other surfaces, by mixing such colours with the aforesaid mixture of a chromate or bi-chromate with organic matter, and applying this new mixture, or combination, to the paper or other fabric.

"The photographic impression is produced upon this prepared surface by the action of light passing through a negative photographic picture, or an engraving, or other suitable object, or screen, or in the camera obscura, and it is then washed with a sponge and a large quantity of water. The albumen, or other organic matter is rendered insoluble at the parts where it has been acted upon by light, and the design is thus produced in the colour which has been employed, &c."

The above important Specification did not appear at the time in the "General Record of Photographic Science and Art," (i.e. the "Journal of the Photographic Society"), and we are sorry to say that in describing M. Poitevin's process of Photo-lithography in *Notes*, No. 35, we omitted to mention the fact of his having patented it in England. His patent for printing in pigments is so indefinite, that one is inclined to believe that he patented an *idea* rather than a process which he had actually tried and found to answer. Besides, his patent includes the

experiment made by Mr. Mungo Ponton, in 1838, with bi-chromate of potass and Saxony blue, so that it might perhaps be set aside on that ground.

These things considered, we advised Mr. Pouncy not to complete his patent, and not to sell guinea licences to practise the process. He listened to our suggestions, and the matter of the agreement is now in abeyance. The Subscription List is of course closed, and the idea of the pamphlet given up for the present. Mr. Pouncy's provisional Specification, which was deposited at the Patent Office on the 10th of April last, contains no particulars from which any one can learn the real secret of his process; and we should be surprised to find that either M. Poitevin, or M. Beauregard had ever produced a presentable carbon print by their patented processes.

We are not at liberty, of course, to publish Mr. Pouncy's secret, but we *are* at liberty to say of his process that it is very remarkable for its economy and simplicity. The material for many hundred prints 10 × 8 would only cost a few pence, and the process is much more sensitive than that in common use. As regards permanence, carbon prints are about as likely to last for twenty centuries as common sun-prints on albumenized paper are likely to fade in a couple of years. With respect to detail and artistic qualities the carbon prints leave "*quelque chose à desirer*," but that will come in time. "Rome was not built in a day."

We deem it right to lay the foregoing particulars before our readers, that they may see that both Mr. Pouncy and we have acted in this matter truthfully and manfully. We are now associated with him in the joint endeavour to perfect the process and carry it out. If our wishes are consulted it shall not remain a secret one moment longer than is necessary to remunerate the inventor fairly for the expense and trouble he has incurred. But it will ever be remembered as a matter of history, that *the most important discovery that has yet been made in Photography* was offered *in vain* to photographers for ONE SHILLING, and that the first specimens exhibited were condemned by the Photographic Society.

The statistics of our Subscription List afford some curious revelations of character. Two or three "bonnie Scots" have put down their names for a guinea; nor has the Sister Island been backward in furnishing subscribers who have said "Put me down for 10s. and *upwards if required.*" The English provinces have also done their part, and the Secretaries of the Societies of Birmingham, and Manchester, as well as of Scotland, are on the list. But as we approach the Metropolis the enthusiasm cools down, and *not one* of the members of the defunct Printing Committee, nor of the talkers at the Meetings of the Photographic Society, whose *ipse dixit* has been received as law for so many years, has helped us in this matter. We deem it right to publish this fact. It is significant. The inevitable conclusion is, that for any important practical purpose which is to benefit photographers at large, the Photographic Society is useless. Even in the case of Mr. Frederick Scott Archer, the widow, after waiting for more than a year, died without receiving the sum that was liberally subscribed for her through that channel. The time has now arrived for the organization of a NEW PHOTOGRAPHIC SOCIETY. The jealousy and incompetency of the old Society is now patent to all.

We have received from Mr. Lovell Reeve, of Henrietta Street, Covent Garden, the first number of the "Stereoscopic Magazine," published by him, monthly. This little work is very nicely got up, and contains three good stereoscopic prints, with descriptive letter-press, all for 2s. 6d. The subjects are,—the Castle of Falaise, Normandy; the Hardinge Statue; and the Greenwich Observatory. There is also an introductory article on the Stereoscope, in which the principles of the instrument are popularly explained. Alluding to the discovery of it the writer says :—

"The names of two distinguished philosophers are associated with the Stereoscope. To Professor Wheatstone we are indebted for the perfect development of the theory on which Stereoscopic effects depend, and for the construction of instruments by which those effects could be beautifully exhibited. To Sir David Brewster we owe that particular form of Stereoscope which we now employ; the simple, though ingenious, principles on which it is constructed being in fact the cause of its exceeding popularity."

The real part which Sir David has taken in the matter of the Stereoscope is in the above paragraph clearly defined; but we can scarcely be said to use now the little box with the tubes and small semi-lenses which he invented; that has given place to Knight's Cosmorama Stereoscope, which he condemns in his Essay; and before long the Cosmorama Stereoscope will no doubt give way to the instrument with whole lenses, which is now being largely introduced in France and America; for it has been demonstrated that the displacement of the images by semi-lenses and prisms is both unnecessary and wrong in principle.

On the subject of the form of stereoscope described in *Notes*, No. 30, M. P. G. Kleffel, of Goldberg, Mecklenburg, makes the following remarks, in a letter just received from him :—

"According to your principle in *Notes*, No. 30, concerning the Stereoscope, I have constructed

one, and can tell you that the pictures taken by a corresponding camera, and seen by the new stereoscope are very beautiful, and exceed the old stereoscope, *far beyond*. I see the objects in their natural situation and much larger than before, and I send you my best congratulations for the simple but skilful rules. But wherefore did the first inventor avoid the simple and natural rules, and choose that cursed way, with semi-lenses and altered focus? Pray tell me. I don't understand that!"

The reason is, M. Kleffel, that man is an imperfect being, and does not see his way clearly at once. He takes many steps in wrong directions, and has to retrace them, before he finds out the right road. This involves the *exercise* of the faculties, without which there cannot be intellectual health and vigour. But shame on those who shrink from facing sound argument, and go blundering on in a wrong course, with a shrug of the shoulders, when the truth is clearly pointed out to them.

The stereoscope with whole lenses 2½-ins. from centre to centre, requires that *the pictures be taken in a suitable camera.* The theory of the *right* form of stereoscope has never, so far as we know, been *completely* laid down but once, and that is in our article in *Notes*, No. 30. Both M. Claudet's and Mr. Erskine Scott's stereoscopes, with whole lenses, are absurdities, *unless the pictures are suitably taken.* Then, natural truth in the dimensions, distance, and proportions of objects is realised. Some day this will be universally acknowledged, because it is infallibly true.

We would call particular attention to a letter in the present number headed "Caution to Dealers in Photographic Glass."

MACCLESFIELD PHOTOGRAPHIC SOCIETY.

The following paper, by the Editor of this Journal, was read at the last Meeting of the above Society :—

ON THE NATURE AND PROPERTIES OF LIGHT.

Mr. Chairman and Gentlemen,

I have felt great pleasure in responding to the request made me a few days since by your Secretary, to prepare a paper to be read at one of the Meetings of your Society; and my only regret is that I cannot be present amongst you to read it myself. My "insular position," among the advantages which it affords me of quiet and retirement, a delightful climate, and sufficient light all the year round for the prosecution of photographic experiments, has also the disadvantage that it cuts me off in some measure from becoming personally acquainted with many photographers whom I should much like to know. Under these circumstances, I can but assure my brethren of the camera of the pleasure it will always give me to see any of them in Jersey; but more particularly any of the members of the Societies of Birmingham or Macclesfield. I have watched with much interest the formation of Photographic Societies, and am convinced that a great deal of good has been done by them; permit me then, to assure you of the pleasure it will always give me to be able, as a journalist, to assist you in your praiseworthy exertions, and I beg you will command my services at any time without hesitation. If I may be permitted to offer you advice with respect to the conduct of the affairs of your Society, I should say, you cannot do better than follow the excellent example of the Birmingham Photographic Society, the members of which have shewn great spirit in the general conduct of their affairs.

And now we will proceed to the subject of my paper, viz., The "Physical Nature of Light and its properties."

The question, "What is Light?" must have frequently occurred to the mind of every Photographer, and it is one to which science is able, fortunately, to offer a satisfactory reply. Since the days of Newton, I believe I may say that no subject has more deeply engaged the attention of scientific men than that of the Nature of Light, and a constellation of the highest talent has been brought to bear upon this problem. It is to a British philosopher, however, Dr. Thomas Young, that the honour is mainly due of having established the true theory of Light; and among other eminent British philosophers, whose researches have contributed to the elucidation of this subject, may be mentioned the honoured names of Professor Airy, Sir John Herschel, and Professor Stokes, (all Senior Wranglers of Cambridge); not forgetting that of Sir David Brewster, whose experimental investigations in Physical Optics, have led to some valuable results. Among foreigners the names of Laplace, Fresnel, Fraunhofer, Zantedeschi, Arago, and many others, are conspicuous, for the services they have rendered in this department of science.

Two different theories have been held with respect to the physical nature of light;—one called the "CORPUSCULAR," the other the "UNDULATORY" theory. According to the corpuscular theory, light is composed of material atoms discharged incessantly, and with enormous velocity, by the luminous body, and which after undergoing various reflexions and refractions, impinge ultimately upon the organs of sight. According to the undulatory theory, light is the undulation of a subtle and elastic ether which pervades space. The corpuscular theory is incapable of explaining many of the most remarkable phenomena of optics, such as those of "Interference," in which the superposition of one luminous spot upon another produces darkness;—whiie most of the phenomena of light can be easily and satisfactorily explained on the undulatory theory. The latter has therefore received the general sanction of men of science, and the corpuscular theory is now abandoned as an absurdity. The undulatory theory has nevertheless had its difficulties to surmount, and apparent anomalies to reconcile,—just as the Law of Universal Gravitation has been at times shaken by the supposed impossibility of reconciling with it certain observed facts;—but these difficulties have been gradually overcome, and the two theories, viz., that of light consisting of the vibration of molecules,—and that of the universal gravitation of particles of matter, now rest on equally satisfactory evidence, and are admitted by men of science as equally true.

The following quotation from the preface to the Tract by Professor Airy on the Undulatory Theory of Light, will convince you that no doubt now exists on this subject :—

"The undulatory theory of optics is presented to the reader as having the same claims to his attention as the theory of gravitation; namely, that it is certainly true, and that by mathematical operations of general elegance, it leads to results of great interest. With regard to the evidence for this theory; if the simplicity of a hypothesis which explains with accuracy a vast variety of phenomena of the most complicated kind can be considered a proof of its correctness, I believe there is no physical theory so firmly established as the theory in question," &c.

I cannot do more within the limits of the present paper, than explain briefly and familiarly the nature of an undulation, and enunciate the theory as it stands. The evidence for it is not by any means of a popular kind; on the contrary, it involves a knowledge of the highest mathematical analysis, and consequently many years of previous training. This, like some other scientific truths, must be taken for granted even by the great mass of educated persons;—but although the evidence would be difficult and laborious to master, the results may be briefly stated, and rendered intelligible in a popular form.

The undulatory theory of light is simply this :—

A luminous body is supposed to consist of material particles in a state of intense agitation. These communicate vibratory motions to the molecules of ether which surround the luminous body, and these again are communicated from molecule to molecule of the ether, in a rectilinear direction through space, and with the velocity of 192,000 miles in a second; so that a ray of light could travel eight times round the earth in a second!

The nature of these undulations will be understood by reference to those produced in a pond of still and deep water, when a stone is thrown into it. Each particle of water moves through a vertical space, without suffering any motion of translation in the direction in which the wave is propagated; and similarly, each molecule of ether vibrates in a line at right angles to the direction of propagation of the ray, and the molecules to which its motion is communicated all vibrate in a plane passing through that line. Let us then consider first the system of vibrations which occur in one plane stretched like a ribbon through space. The velocity of light, although enormous, is not infinite, and time is occupied in the transmission of vibrations, so that whilst one molecule of ether is at one part of its short transversal path, another molecule is at some other part, and the curved line drawn through the instantaneous positions of a system of vibrating molecules exhibits a system of undulations. It will be understood that the molecules of ether do not travel *along* the line of the ray,—but merely oscillate through an exceedingly small space on either side of it, losing their velocity at either end of their path and having the greatest velocity when crossing the line of the ray,—just as the bob of a pendulum which is describing small oscillations has its greatest velocity when crossing the vertical line through its point of suspension. The molecules of ether no more travel *along* the line of the ray than the log which is thrown overboard from a vessel travels in a horizontal direction along the water, it being merely raised and lowered through a small vertical space by the undulation of the water.

The nature of an undulation of light is now, I hope, clearly understood. It differs from one of sound, (which is an undulation in the air), in this important particular, viz., that in sound the particles of the air vibrate *in the direction* of propagation of sound, and not transversely to it; so that if Light is compared to the undulations in a pond of water, Sound may be compared to those of a field of corn when the wind sweeps over it, the motion of each separate ear taking place in a small circular arc, of which the root is the centre, and therefore occurring in the direction in which sound is propagated.

But a ray of common light is not composed of a system of undulations propagated in *one plane only*, but in an infinite number of planes, passing through the direction of the ray, and making all possible angles with it; and this brings me to the subject of "Polarized Light."

There are some transparent bodies whose internal structure is so peculiar that a ray of common light cannot entirely pass through them, so that the light which *does* pass through is altered in its character, or "polarized," as it is termed. Tourmaline is an instance of this. The fibres of a thin sheet of this substance are supposed to be arranged like the bars of a gridiron, so that of the infinite system of planes of undulation of a ray of common light, only one ribbon, as it were, can be passed between the bars of the tourmaline, and the transmitted ray is thus reduced to a system of undulations in one plane only. A ray of common light may therefore be considered as round, like a ruler; a ray of polarized light as flat like a ribbon. If a second sheet of tourmaline is placed with its fibres crossways to the first, it will completely intercept the polarized ray; so that two layers of a transparent substance may be converted into an opaque screen!

If a ray of common light is incident upon the surface of a crystal of Iceland spar, it is divided into two rays, one of which follows nearly the ordinary law of refraction,—the other a totally different law; but both emerge parallel to the incident ray, and therefore parallel to each other; aud both are polarized by refraction through the crystal,—the planes of undulation, or "planes of polarization" as they are termed, being at right angles to each other. This is called "double refraction."

There are other kinds of Polarized Light, called Circularly, and Elliptically Polarized Light. In the former case the undulation forms a spiral, like a corkscrew, about the line of direction of the ray; and in the latter case the spiral may be supposed to be coiled round an elliptical instead of a circular cylinder.

I have endeavoured to compare Light with Sound. Let us return to that comparison.

Sound travels in air at the rate of 1100 feet in a second, but it is much more rapidly transmitted through water, and more rapidly still through a bar of metal. Light travels through space at the uniform rate of 192,000 miles in a second. The length of a wave of sound varies from a few inches to several feet, the short waves giving the high notes, the long waves the low ones. The length of a wave of light is about the 40,000th part of an inch in the case of red light, and the 60,000th part of an inch in that of violet light,—so that the undulations of light are not only propagated with extreme velocity, but are also extremely small. You will perceive also that the difference between the colours of light depends upon the *length of the undulation*, the red having the longest and the violet the shortest wave. I would observe also that the

supposed decomposition of orange, green, and violet light by absorption into red and yellow, blue and yellow, and blue and red, is a notion of Sir David Brewster's which is not admitted by men of science, and with respect to which Prof. Airy, Helmholtz, and others, are at issue with him; the general notion being that to each colour of the spectrum belongs a wave of particular length, and therefore a light of a peculiar and distinctive physical character.

And now that we are on the subject of the colours of the spectrum, let me crave your particular attention to what follows. It is well known that the *short* waves of violet light produce most *chemical* action on the salts of silver and many other substances; that the waves of yellow light, of *medium* length, produce *Light* in its greatest intensity; and that the *long* waves of red light are those in which *Heat* prevails;—while beyond the spectrum, at the violet end, are invisible *chemical* rays, and at the red end invisible *heat* rays. May we not then conceive that Light, Heat and Actinism, and probably all the various forms of Electricity, are the same thing, viz., motion in one and the same universal ether which pervades space, and fills the interstices between the ultimate atoms of bodies; the difference between these agents consisting simply in the *length* of the wave, and possibly the nature of the undulation?

Let us briefly compare Heat with Light, and Actinism. They all travel with the same velocity; Heat rays may be reflected, refracted, and polarized like those of light; and they all produce chemical changes in bodies;—while conversely, chemical changes are frequently accompanied with the evolution of Light, Heat, and Actinism; a lime-ball for instance, in a jet of ignited hydrogen and oxygen gases, evolves Light, Heat, and Actinism. Again; when a body is held before a source of radiant heat, it becomes heated, that is, it becomes itself a source of radiant heat;—similarly, in the case of "solar phosphori," certain bodies, calcined oyster shells for instance, when exposed to sunshine, become themselves luminous when taken into a dark room; and, according to the recent experiments of M. Niepce de St. Victor, a sheet of white blotting paper, after exposure to sunshine, is capable of emitting in the dark actinic rays. Is it not then highly probable, nay, *certain*, that Heat, Light, and Actinism, are undulations in the same ether, differing only in the length of the wave?

These are, I think, suggestions worthy of your serious consideration. I do not advance them as either original or peculiar. They are not my notions alone, but are gaining ground day by day among men of science, and every new discovery seems to add fresh support to them.

Now with respect to the ether itself, and the ultimate constitution of bodies.

In mechanical science, the definition of matter includes whatever has *weight*. If a thing can be *weighed* it is material, if not, *immaterial*, or which amounts to the same thing, "imponderable." Now the ether in which light is propagated is far too subtle to be weighed; it does not therefore come within the definition of matter;—the molecules of which it is composed are not sensibly subject to the law of gravitation. Nevertheless it may be, and no doubt is, material. Indeed we cannot conceive of it as existing in any other form than that of matter. That it should not possess sensible weight might be concluded *à priori*, from the enormous velocity with which undulations are propagated in it. If the undulations in so subtle a fluid as air, produced by the discharge of artillery, and propagated at the rate of 1100 *feet* in a *second* are sufficient to break the windows of houses, what would be the effect of such undulations as those of light, proceeding at the rate of 192,000 *miles* in a second, if the fluid in which they were propagated had sensible weight, as air has? They would of course entirely smash and destroy everything on which they impinged. If a stranded vessel is now gradually broken to pieces by the battering of the surf, how long would she be able to withstand the action of such undulations as those of light, if propagated in a fluid which was sensibly material? She would surely be reduced to impalpable powder by the first flood of light that fell upon her. Knowing then the vast velocity with which light travels, we must not expect to find the lumeniferous ether sensibly ponderable when tried by any such tests as man can apply to it. Nevertheless its materiality might be proved in other ways. A material fluid pervading space would act as a resisting medium to the motions of the heavenly bodies, and its effect would be to cause them to describe continually decreasing orbits about the centre of gravity of the system to which they belong, and ultimately, in the course of æons of time, to bring all the bodies of the universe to one single lump of matter, non-luminous, intensely cold, and having no motion either of translation or rotation, for both would be destroyed. If then the lumeniferous ether be a resisting medium, as it surely must be, its effect would first be perceived upon the comets of the solar system which revolve in short periods about the sun. Such are the comets of Encke, and Biela, the first revolving in $3\frac{1}{4}$ years, the latter in $6\frac{3}{4}$ years. Now it is found that *from some cause or other* the period of Encke's comet is diminished by a few hours in each revolution. Here then is something like evidence of what we should expect to result from the action of a resisting medium on bodies of so little mass as comets. But we must not be too hasty in jumping at conclusions, for there may be nebulous matter surrounding the sun, and this may produce the effects above alluded to upon a comet passing through it.

The question of the constitution of bodies involves of course much that is at present hypothetical, but the conjectures which I shall offer for your consideration are borne out, I think, by a good deal of sound reasoning based on observed facts. It appears then that there is no such thing in nature as actual contact between the ultimate atoms of matter, and that these are constantly in a state of vibration, the intensity of which depends in great measure, if not entirely, on that of the ether existing within the body. We know, for instance, that bodies in general expand by heat and contract by cold. But a solid piece of iron may expand and yet continue solid; how then can there be actual contact between the atoms in both cases? and yet solidity is not destroyed; the iron does not tumble to pieces on being warmed, it expands and yet remains solid. When a body is heated beyond the temperature of surrounding objects, it expands beyond the dimensions which are consistent with that temperature, and on removal of the source of heat begins to contract. By contracting, the vibrations of the ether contained within it are increased in intensity, and intensified vibrations are therefore communicated to the surrounding ether, that is to say, the contracting body becomes a source of radiant heat. It appears to me that the sun may be now precisely in that condition. He may be contracting in volume, and thereby propagating undulations of light, heat, and actinism in the ether which surrounds him. The

time may come when he will contract no more. Like the planets which were once incandescent globes of fluid, emitting light and heat,—but which have now cooled down, crusted over, and become opaque and non-luminous, the sun may himself contract, skin over with a solid crust, and cease any longer to be the lamp of our system. Ages ago the whole matter of the solar system was probably distributed in a nebulous form over a space far exceeding the orbit of Neptune; the temperature of this nebula being perhaps nearly as low as that of space; but the atoms were impelled towards a common centre of gravity by the law of gravitation, and the nebula began to contract, acquiring at the same time rotatory motion. The evolution of heat and light then commenced. As the vast whirling mass, now luminous, continued to contract, planets were thrown off, and as they by the operation of the same law became spherical, and contracted, rings were formed and satellites thrown off from them. Mercury is the last planet that was detached from the sun, but more may yet be detached;—the sun may go on contracting and throwing off planets; until at length the limit is reached, and then he may become encrusted with an opaque coat, and, like the planets, cease to be self-luminous. Such may be the fate of our sun; and the solar system may be doomed to roll for ages through the icy regions of space, a dark and cheerless cluster of frozen worlds;—possibly like other systems which have already passed through the self-luminous phase of their existence.

There are one or two other matters connected with the undulatory theory which will no doubt interest you, as photographers, and on which I will offer a few brief remarks. These are, the "Diffraction of Light, and the Polarization of Light by Reflexion."

In Geometrical Optics a ray of light is treated as a straight line, and is not supposed to be capable of being bent round a corner; yet we find this to be a very imperfect view of the matter. When a carriage turns the corner of a street we still continue to hear, in a modified degree, the rumbling of the wheels;—and in the same way rays of light may be bent round the edges of bodies, and thus shadows are not bounded by well-defined straight lines. If light is admitted through a small hole in the shutter of a darkened chamber, a white screen placed opposite to the hole, and an opaque body placed so as to intercept some of the light and cast a shadow upon the screen, the shadow is found to decrease gradually in blackness toward the edge, and round the edge are arranged a number of coloured bands separated by dark lines. This effect is produced, partly by the undulations of light being propagated *laterally* as well as *directly*, on passing round the edge of a body,—and partly by what is called the "Interference" of undulations,—the dark lines being produced by that kind of interference in which the crest of one wave exactly fills the hollow of another, and the colours by interference of a more complicated character, and which I cannot now discuss.

This bending of a ray of light, so to speak, round the edge of a body is called the Inflexion of light, or "Diffraction." It has been thought by some persons likely to interfere with the obtaining of a sharp, well-defined copy of a negative, by light transmitted through it, and received upon a lens; but I have no hesitation in saying that this idea is a mistake.

Light may be polarized by reflexion, as well as by refraction. If a ray of light is incident upon a sheet of plate glass at an angle of about 57°, the reflected ray is completely polarised. Sir David Brewster discovered that in order for this to happen at the surfaces of different media, the tangent of the angle of incidence must be equal to the refractive index of the medium. The refractive indices of opaque bodies may therefore be found by this law of the tangent. The refractive index of a medium is, according to the undulatory theory, the ratio which the velocity of the propagation of the undulations in vacuo bears to that in the medium; it being understood that the velocity of light is diminished on entering a denser medium, and conversely. Since the rays of different colours have a different refractive index for the same medium, it follows that their velocity in a dense medium is not equal, as it is in vacuo. This was for some time a difficulty, but it has now been cleared up.

You will perceive that photographs might be taken by light that is entirely polarized. I do not think this subject has received much attention.

And now, Gentlemen, I must conclude this paper. There are some among you, no doubt, to whom the interesting facts which I have stated are well-known, but probably others to whom they are new. If this brief sketch of a subject which lies at the root of Photography should have afforded you any pleasure, or have whetted the curiosity of any of you for more information, my object will be answered, and I shall be much gratified at having been able to contribute my share towards the amusement of the evening.

THOMAS SUTTON.

St. Brelade, Jersey, June, 1858.

MICRO-PHOTOGRAPHY.

A few days ago Mr. Howlett sent us several very good prints of microscopic subjects, taken about 4-ins. diameter. In reply to our enquiry as to how he took them, we received the following letter for insertion in the *Notes*:—

Dear Sutton.—I am glad you think my microscopic photographs good. As to the way in which they are done, I have nothing new to tell you. I have one of Ross's best microscopes; to this is attached a camera, 6-ins. square by 4-ft. long. The light of the sun is condensed upon the object to be photographed, by means of a large plane reflector, and a double convex lens of 6-ins. diamr. In fact a condensing apparatus, which I made for a Solar Microscope some years ago. To have the object well illuminated by the direct rays of the sun is one of the most important things. The specimens which I sent you were all done with the object-glass which Ross calls the two-thirds-of-an-inch, with the exception of the Antennæ of the gnat, which was done with the 1½-in. object-glass. It is always better to enlarge the object by increasing the length of the camera, (when you can do so), than by using object-glasses of higher power. The first thing to be done is to find out correctly the chemical focus of the object-glass you are going to use. This can only be done by *experiment*, with the fine *adjustment* of the microscope, and it will take some dozens of trials. With my two-thirds-of-an-inch object-glass, the difference is 15·000 of an inch. The next thing to be observed is *never* to use a larger *angular aperture* than is

actually required to display the object, but to cut off the excess of aperture by means of a stop, placed against the posterior lens of the object-glass. I consider this very important. It does not do to try and make the chemical and visual focus coincide by adding other lenses to the object-glass. I do not use a great many object-glasses of various focal lengths, but stick to one or two; but the length of the camera can be varied at pleasure. I never try to work in a bad light, or by *artificial* light; it is all waste of time. When object-glasses of higher power than the two-thirds-of-an-inch have to be employed to display an object, difficulties increase at a rapid rate, and other rules have to be observed, which I am not at present prepared to state positively.

I have very little spare time and can only work at this subject occasionally; but I hope in the course of a month or so to send you specimens of some of the magnified impressions taken with the half-inch, quarter-inch, or even the eighth-of-an-inch object-glass. I believe I have now told you all I know upon this subject in order to produce specimens as good or even better than those I sent you. The operator need only possess a good microscope and plenty of perseverance. I consider the two-third's-of-an-inch object-glass the best to work with. Yours truly,

ROBERT HOWLETT.

10, Bedford Place, Kensington.

MR. GRUBB'S PATENT VIEW-LENS.

Mr. Thomas Grubb, of Dublin, has lately patented a View-Lens. In our last number we described the construction of this lens, and observed that the patent would not, in our opinion, hold good, inasmuch as a formula given by us in No. 33 of this Journal for a view-lens, includes the case of Mr. Grubb's lens. This we shall prove in the present article, and then leave the matter in the hands of our readers.

On referring to p. 305, No. 33, of this Journal, it will be seen that, in reply to a correspondent, G. A. M, we give the following formula for a view-lens :—

"The radii of the curves are determined from the following equations :—

"The KNOWN quantities are :—the ascertained refractive and dispersive powers of the crown and flint glass,—the radius of curvature of the outer surface of the flint lens,—and the focal length of the combined lens for parallel rays. These are the data. The UNKNOWN quantities are :—the radius of curvature of the inner surface which is common to both lenses,—and the radius of curvature of the outer surface of the crown lens. There are consequently six *known* and *two* unknown quantities."

"The equations by which the unknown quantities are determined result from the following relations which exist among the quantities involved :—

"1st.—The reciprocal of the focal length of the combined lens is equal to the algebraic sum of the reciprocals of the focal lengths of the component lenses.

"2nd.—The focal lengths of the component lenses are proportional to the dispersive powers of the refractive media.

"3rd.—The reciprocal of the focal length of a lens is equal to the difference between the reciprocals of the radii of the surfaces, multiplied by the decimal part of the refractive index of the medium."

Now, in the *first* place, we will state the above formula in algebraic symbols, and work it out in the case of the common view-lens with the *flint* glass in front. In the *second* place we will put the *crown* glass in front, and work it out again, showing that it gives Mr. Grubb's patent lens, and that these two forms of lens are the only possible solutions of the problem of achromatizing a meniscus lens,—both being included in our formula

Let F = principal focal length of compound lens.
" f = " " anterior "
" g = " " posterior "
" R = radius of anterior surface.
" s = " interior "
" t = " posterior "
" M = mean refractive index of anterior glass.
" N = " " posterior "
" D = ratio of the dispersive power of the material of the front lens to that of the back lens.

Then, the first Equation becomes

$$\frac{1}{f} + \frac{1}{g} = \frac{1}{F}$$

The second Equation becomes

$$\frac{f}{g} = -D$$

The third Equations become

$$\frac{1}{f} = (M-1)\left(\frac{1}{R} - \frac{1}{s}\right)$$

$$\frac{1}{g} = (N-1)\left(\frac{1}{s} - \frac{1}{t}\right)$$

In these Equations, the *capital* letters, R, M, N, D, are the *known* quantities, the *small* letters, f, g, s, t, the *unknown* quantities.

Now let us proceed to make a lens according to the formula; and for the sake of example

Let F = — 20 inches
" R = + 60 "
" Refractive index of flint glass = 1.58
" " " crown " = 1.52
" Dispersive ratio of flint glass to crown glass $\Big\} = \frac{13}{9}$

Putting the flint glass in front gives the common view-lens.

The Equations become

$$\frac{1}{f}+\frac{1}{g}=-\frac{1}{20} \quad \ldots\ldots \quad \text{i}$$

$$\frac{f}{g}=-\frac{13}{9} \quad \ldots\ldots \quad \text{ii}$$

$$\frac{1}{f}=\frac{58}{100}\left(\frac{1}{60}-\frac{1}{s}\right) \quad \ldots\ldots \quad \text{iii}$$

$$\frac{1}{g}=\frac{52}{100}\left(\frac{1}{s}-\frac{1}{t}\right) \quad \ldots\ldots \quad \text{iv}$$

When these are worked out, they give

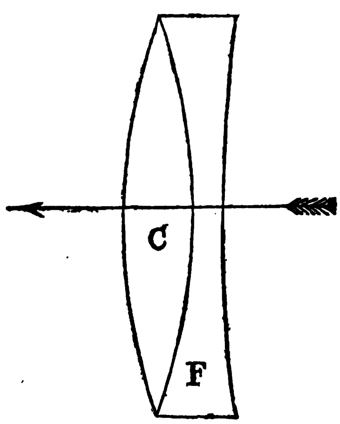
$$f=+8\frac{8}{9}$$

$$g=-6\frac{2}{13}$$

$$s=-5\frac{395}{617}$$

$$t=+7\frac{373}{941}$$

The form of the lens is therefore as shown in the following figure, in which the arrow represents the direction in which light passes through it, and the letters F, C, denote flint, and crown glass.



This is the common view-lens.

Next, let us put the *crown* glass in front and see what the formula leads to.

The Equations now become

$$\frac{1}{f}+\frac{1}{g}=-\frac{1}{20} \quad \ldots\ldots \quad \text{i}$$

$$\frac{f}{g}=-\frac{9}{13} \quad \ldots\ldots \quad \text{ii}$$

$$\frac{1}{f}=\frac{52}{100}\left(\frac{1}{60}-\frac{1}{s}\right) \quad \ldots\ldots \quad \text{iii}$$

$$\frac{1}{g}=\frac{58}{100}\left(\frac{1}{s}-\frac{1}{t}\right) \quad \ldots\ldots \quad \text{iv}$$

When these are worked out, they give

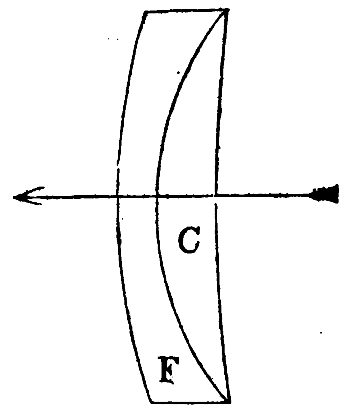
$$f=-6\frac{2}{13}$$

$$g=+8\frac{8}{9}$$

$$s=+3\frac{3}{79}$$

$$t=+7\frac{373}{941}$$

The form of the lens is therefore as shown in the following figure:



This is Mr, Grubb's patent lens, given by a formula which was published SIX MONTHS BEFORE he applied for his patent.

[ED. P. N.]

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

CAUTION TO DEALERS IN, AND USERS OF PHOTOGRAPHIC GLASS.

To the Editor of Photographic Notes.

DEAR SIR,—I will just beg a small space in your columns, for the purpose of calling the attention of dealers in Photographic Glass to the importance of being very careful in the selection of the materials used in wrapping up the plates; very often pieces of old newspaper or other kinds of printed, and soiled white paper, are used to go between the glasses, for the purpose of preventing scratches in carriage; but in endeavouring to avoid one evil, they have unfortunately fallen into another of a far worse kind. The result affords a proof of the correctness of Niepce's theory, for after a piece of printed paper has been in close contact with a sheet of glass for some time, the *whites* of the paper will be found to be indelibly impressed on the glass, and not only on, but actually *in* the body of the glass, indeed, so much so, that neither nitric acid, nor any other cleansing agent will remove it, and the stain will inevitably show itself in the finished picture.

I have frequently noticed these markings; but have never given the matter much thought, until a few days since, I called upon my friend Mr. Rejlander, who shewed me several plates with distinct marks of printing upon them, which had effectually resisted the action of nitric acid. The glasses were large, and of patent plate, and therefore the loss was serious. I enclose you a proof from a negative, taken on one of the glasses. The irregular white marking across the body, is caused by the margin of a printed sheet, and is a black mark in the negative. The annoyance arising from this cause will, I think, need no comment.

Yours faithfully,

W. B. Osborn, *Treas. B. P. S.*

ON THE GLASS USED FOR LENSES.

To the Editor of Photographic Notes.

Sir,—I perceive in your last number a commendation of Mr. J. T. Goddard's Lenses, by a M. A. and in which a portion of a private letter of mine appears. I can fully bear out all I have therein stated; but as only part of my letter of May 24th is introduced, and lest anything like disparagement to Mr. Davidson's Lenses should enter the public mind, I beg most respectfully to say that the reason of my laying aside the lens made by Mr. Davidson (which has given rise to the present introduction of my letter sent to the Photographic Journal three years ago) was, as I fully stated to Mr. Goddard in the note of May 24th, that the lens was all I could wish for until I found the visual and actinic foci were gradually becoming different; then necessity compelled to lay it aside and purchase the one made by Mr. Goddard. A while after this curiosity led me to place the lenses on white paper, and I found the 21-in. focus lens had become a decided yellow colour. I then took the lenses to pieces and I found the plate lens had turned yellow, similar to many of the samples of plate glass that change colour in shop and other windows, and thus I accounted for the defective action of my lens by Mr. Davidson. Opticians ought to be very careful not to use any glass having the yellow-green tint; they ought to use glass only inclining to the blue-green tint. I have very carefully examined those popular lenses by Petzval and Voigtlander, both in the formula of their curves, &c., and in each of those fine lenses the plate glass portion of the lenses was a decided violet tint It is much to be regretted that our British opticians do not pay more attention to this important article, so evidently superior in foreign manufacture. The dense flint of British make that I have seen has a pale straw yellow tint, whilst the foreign is pure and colourless, and to this cause alone must arise the quick action of foreign lenses generally. There is also another cause of discolouration in glass, arising from the use of colcather to polish with, the base of which is iron. If this is not thoroughly cleaned out of the glass there may be under certain causes oxidization, and this produces yellowness. I have often thought all lenses so finished ought to be soaked in nitric acid to dissolve out all the polishing media, for by the great friction in polishing minute portions will be pressed into the porous surface of the glass and remain there to be acted on as I have stated.

Your obedient servant,

Jno. Brown.

69, Blenheim Street, Newcastle-upon-Tyne.
June 21, 1858.

—The German opticians appear to carry off the palm from those of England and France. They have equal science, and better optical glass. The object-glass of the new Equatoreal about to be put up at the Greenwich Observatory was made by M. Mentz, of Munich. The best optical flint glass now made is said to be that of M. Guinand, of Geneva.

[Ed. P. N.]

PAPER NEGATIVE PROCESS IN "NOTES," NO. 12.

To the Editor of Photographic Notes.

Dear Sir,—I feel a pleasure in directing the attention of photographers to the very excellent paper process described in *Notes*, No. 12, which will be made evident by the following facts:—I was engaged to take 14 views in the town of Cardiff, to be used as evidence before a Committee of the House of Commons, in order to obtain a local act for the improvement of the Town. I first tried oxymel plates and failed. I then prepared 14 papers, 9 × 7, and exposed them all in one day, using two double dark slides, and had the satisfaction of returning home with 12 *negatives*, all good. The papers were prepared over night, and developed next evening; thus I had sufficient time to travel 8 miles and expose 14 papers, without assistance, in one day. The order was given on Friday night, and the negatives taken, and the prints from them finished and delivered in London by the following Thursday morning, which I do not think could have been done by any other process. Enclosed is a print from one of the negatives, that will prove that the process is suitable for a great variety of subjects, and for certainty none can equal it. The print is on Harrison's paper, by a process of my own; no toning-bath used, but simply fixed in fresh hypo. Thos. Gulliver.

22, Fisher Street, Swansea,
June 24th, 1858.

P.S. The time required for the negative of the print sent was $6\frac{1}{2}$ minutes, clear light, Ross's lens $2\frac{1}{2}$ and 14-in. focus.

—We greatly admire the print sent by our correspondent; it is on plain paper, and a fine rich purple black, without any yellowness in the lights; he would much oblige us, and no doubt numerous readers, by communicating the process, which looks very like our last development process in *Notes*, No. 42. As for the negative process in No. 12, (M. Blanquart Evrard's), there is certainly no other paper negative process one-half so good. Some of the most artistic photographs we have seen are those of Mr. Stewart, of Pau, taken among the Pyrennees, by this process. In a letter we received lately from the Rev. Mr. Raven, he says, "that when at Pau, last winter, Mr. Stewart shewed him a series of prints from his negatives, which were printed five or six years ago

by M. Blanquart Evrard, and told him that *not one had faded*, all being as fresh and good as ever, and that he considered that style of printing very fine and quite satisfactory." We have had for some years a great number of these subjects, and always look at them with renewed pleasure. The same things taken upon collodion, and printed upon albumenized paper by the common method, would be no better, in our opinion, than so much waste paper. With respect to collodion, tents, &c., the paramount consideration with the photographic tourist should be, CHOICE OF SUBJECT, and STYLE OF PRINTING. With the paper process of No. 12, a beautiful style of plain printing, *free from filthy sulphurous yellowness*,—and a keen appreciation of picturesque and sublime scenery on the part of the operator, photographs may be taken which beat the ordinary run of things taken in vans and tents *out of the field*. In landscape photography, subject, atmosphere, chiar'-oscuro, half-tone, and detail in the shades, are of the FIRST importance, and mere "finesse" of comparatively *none;* then, to these artistic qualities of the *negative* must be added artistic qualities of the *print*. When these are wanting a photograph becomes a mechanical production which interests no one except the unfortunate who has wasted time and chemicals upon it.

A little salt may sometimes be added to the iodizer in No. 12 with advantage. [ED. P. N.]

"*Neve Flaherty.*" The "American Journal of Photography" is published fortnightly by Mr. C. Seeley, No. 424, Broadway, New York; price one and a-half dollars, (six shillings), per annum; postage to England, one penny.

The solarization of the skies of collodion negatives may be diminished by substituting a little chloride of magnesium for an equivalent quantity of iodide of potassium in the iodizing solution. This plan appears much better than introducing a bromide into the collodion. [ED. P. N.]

"*John Davies.*" The mixture employed by opticians for blackening the insides of brass apparatus is made by adding lamp-black to French polish; the mixture dries without leaving any gloss. Wood-work may be blackened by a mixture of glue and lamp- black; it dries to a *dead* black. Never use chloride of platinum for brass work; it does not destroy the *polish* of the metal.

[ED. P. N.]

"*W. Spring.*" Old iodized collodion, which gives a rotten film, may sometimes be added *in very small quantities* to new negative collodion to increase the density of the blacks. Otherwise it is useless. [ED. P. N.]

"*D. K. W*" puts the following queries:

"In focusing for a picture with a stop, I find that there is a small bright round patch of light according to the size of the stop used in the centre of the ground glass, the corners and edges being in the shade, so that I cannot see nicely to focus the image. Will you be so kind as to give me some information concerning it; and can you inform me where I can purchase the 'colourless shellac' for varnish?"

—We suppose the stop was placed too far in front of the lens. The colourless shellac can be obtained from Messrs. Simpson, Maule and Nicholson, No. 1, Kennington Road, London, S.

[ED. P. N.]

"*Photos.*" Mr. Pouncy's process can be applied successfully to the printing of positive portraits upon plain paper, *which are to be retouched by the artist*. That is its chief use at present, and a very important one it is, because portraits elaborately painted upon ordinary photographs are frequently destroyed by the photograph fading and turning yellow. Carbon prints, retouched in Indian ink, would probably last for many centuries. As the manipulation of Mr. Pouncy's process becomes better understood, retouching will, no doubt, become unnecessary.

With respect to the spangles produced by the positive developer, we imagine it to have been kept too long. Make fresh or add more proto-sulphate to the old developer. In hot weather the developer described in our treatise becomes rapidly deteriorated. [ED. P. N.]

"*J. W.*" Your collodion, (Ponting's), may be too glutinous, either from being iodized with iodide of cadmium, or from the evaporation of the ether. Add a little ether to it, and if that does not answer, write to Mr. Ponting. His collodion bears a very high character for general practical work.

[ED. P. N.]

☞ *The Communications of "T. B."; "J."; and "Stereoscopic"; will be noticed in next Number.*

*** *Mr. Ross's Paper on the Petzval Lens arrived* TOO LATE *for insertion.*

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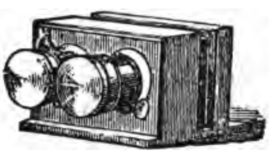

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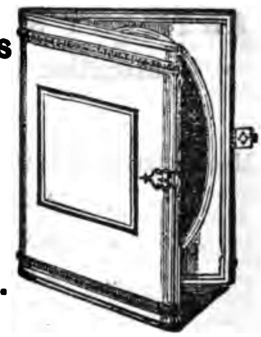

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Photographic Notes.

AUGUST 1, 1858.

We are expecting at any moment to see a beautiful schooner yacht from Southampton, belonging to one of our Subscribers, round the western point of St. Brelade's Bay, run in, and send a boat ashore to take us off for a few days on a photo-yachting excursion to the coast of Brittany. We have arranged our plans, so that *if nothing unforeseen occurs*, the publication of the next number of this Journal will not be delayed, but *should* any circumstance occur to mar these engagements, we trust to the kindness of our readers to excuse for once the delay. The Photographic Dictionary advertised in the present number, has been a very arduous job, and has kept us pretty closely to the desk for several months; a little holiday has at length become really necessary, for it is a bad plan to keep the mind too long occupied with one idea. We hope on our return to go to work again with renewed vigour.

The present number contains two very interesting communications on the subject of the Orthoscopic Lens; one from the inventor, Professor Petzval, the other from the celebrated optician, Mr. A. Ross, of Featherstone Buildings. There cannot now remain a doubt as to the merits of this new instrument; in fact only one individual that we have heard of has ventured to raise an objection to it, and that is Mr. Shadbolt; but these objections he will find fully answered by Mr. Ross's remarks in the present paper, and also in our article in No. 49, in which the geometry of the lens is discussed in a way which appears to have satisfied M. Petzval himself. We repeat then, that no doubt can now exist in the the mind of any unprejudiced person as to the great superiority of the Orthoscopic view-lens over the single view-lens of any form; that superiority being shown in the most essential point, viz., FREEDOM FROM DISTORTION. In order to make this clear to the mind of any reader who is willing to bestow a moment's thought upon it, we will suppose that he requires to take a view upon a plate 10×8. If he use a single view-lens, it must be 15-ins. focus, and $2\frac{1}{2}$-ins. diameter; —if an Orthoscopic lens, it may be $11\frac{1}{2}$-ins. focus and $1\frac{1}{2}$-ins. diameter. Now the amount of distortion produced by a lens depends upon the amount of excentricity of the oblique pencils, that is to say upon the distance of that part of the lens through which they pass from its centre; consequently, the smaller the lens the less the distortion. That is why the Orthoscopic lens has the advantage over the other in the matter of distortion. But not only so, the amount of distortion produced by a lens is not directly proportional to its diameter, but increases in a much greater proportion as the excentricity of incidence of the oblique pencils increases. In the Orthoscopic lens the greatest excentricity is only three-fourths-of-an-inch, while in the single view-lens it is $1\frac{1}{4}$-ins., and it is within this annulus of a half-an-inch in breadth, by which the single lens exceeds the Orthoscopic, that the pencils which produce appreciable distortion are incident. If we push in the stop of the single lens until this annulus is cut off, the definition of the marginal object is sacrificed, but the lines of the picture are no longer appreciably bent and distorted; and so far as distortion is concerned the case is then parallel to that of the Orthoscopic lens when reversed and presented with its small lens to the objects. It is then a great point gained to be able to construct a lens which gives a sufficiently flat field, with a scarcely appreciable amount of distortion, while the very little there is occurs *in the right direction*. With respect to Mr. Shadbolt's paper, if he consults our article in No. 49, and *studies it carefully*, he will find the exact converse of his assertions demonstrated. This gentleman has planted himself as a stumbling block directly in the way of PROGRESS, and will be run over unless he gets out of the way. Both the mathematician and practical optician have decided against him. It remains for him to admit his mistake, and put his readers in the right. He has thrown us down the glove and we have replied to the challenge; but it is wearisome to deal with an antagonist whom you cannot pin down to the geometry of a simple question. Suppose a man is offered the geometrical proof that the three angles of a triangle are equal to two right angles, and he replies, "I have measured a triangle and find that it is not so";—what can be said to such a man but, "Go and measure it again?" or, "Be good enough to step on one side; you block the way." Considering the peculiar way in which Mr. Shadbolt terminated a little private discussion with us the other day, we are amazed that he should again have invited a controversy. In future we must refer him to any of the excellent teachers of mathematics with whom London abounds. Discussions of elementary points in Optics lower the tone of any Journal in which they appear, and bore every intelligent reader.

In Mr. Ross's paper there are some excellent remarks with respect to Mr. Grubb's lens. He shows that it does not remedy in the least the defect of distortion, to which every single lens with a stop in front is liable, and that being the case, any supposed merit it may have on the score of diminished spherical aberration is hardly to be counted an advantage. We agree with him. Nevertheless, if a single view-lens *is* to be used for any purpose, and any optician may, if he chooses, adopt the plan, seeing that we gave the formula for it more than a year ago, in No. 33, as proved in the last number.

In an advertisement, headed "LENSES," with a reference to Mr. Rothwell, allusion is made to a mode of combining existing lenses in such a way as to produce a very flat field and fine marginal definition with a tolerably large aperture. Mr. Rothwell has explained to us his plan, and invited our opinion of it. We quite believe it will do all that he says, but distortion remains uncorrected. The "dodge" is worth knowing, and for certain purposes may be found useful.

In concluding this article on lenses we would advise our readers not to dream of taking views, (except stereoscopic views which include a small angle), with a portrait-lens, having a small stop between the lenses; and above all, to have nothing to say to any plan of introducing a third lens between the front and back lenses of a portrait-combination. In both cases the principle is wrong, as every well-informed optician knows.

We have received communications from two or three well-known opticians, stating that Mr. Grubb's patent lens is quite an old story, having been made by them years ago. It can scarcely be otherwise, for every intelligent optician must know that there are two ways of achromatizing a meniscus. The old form has been adopted because it involves the least trouble and expense, and the defects are more under control. Mr. Grubb's lens is not in any *important* point superior to the old one, the curvature of the image and distortion being exactly the same in both. In this affair Mr. Grubb (that "champion of science,") has simply made a cat's-paw of the Photographic Society; and as to the patent, it can only be a subject of amusement to every practical optician, for what he has done before he can of course do again. If our readers desire to work with the best possible instrument let them by all means procure an *Orthoscopic* lens, and not throw away their money on any more single lenses with a stop in front. That form may now be considered *exploded.* Instead of sending for a new lens to the Green Island, we advise them to make their choice between the "Petzval," to be obtained from Herr Pretsch, the "Orthographic," from Mr. Ross, the "Orthoscopic," from Messrs. Knight, or the "Caloscopic," from Messrs. Horne and Thornthwaite; under which different names *the same construction is meant*, and that lens is a great and important improvement, and should be in the hands of every sensible photographer.

The following extract from the letter of a correspondent, (one of the most distinguished professional photographers in London), with respect to Mr. Pouncy's Carbon Printing Process, expresses with some *naïveté* the opinions of a large section of photographers :—

"Put my name down for a couple of copies, but I have no faith in it. The things exhibited are wretched trash. Nevertheless, there is a wail heard through the length and breadth of the land, "Who is to deliver us from hypo?" It is a wily, deceitful wretch, keeping the promise to the eye and breaking it to the hope. It is the *bête noire* of Photography. To what point of the compass are we to look for relief? Where are we to look for the cloud no bigger than a man's hand? Will it shower down uranium or carbon? Meantime the hypo-bath is to the photographic pilgrim's progress a certain slough of despond."

We admit the story of the "trash," but the facts are simply these : — The carbon prints exhibited by Mr. Pouncy are printed upon the back of Marion's Albumenized paper, from negatives which have been a long time in use for experimental purposes, because they were too bad to be spoiled. The exhibition of these prints has had an effect prejudicial to the process; but we can assure our readers that carbon printing is capable of much better things than those specimens, and that it *will* give beautiful definition and half-tone. Mr. Pouncy has now got a more suitable kind of paper and obtains better results. We believe he intends to organize a printing establishment at Dorchester, but whatever his plans may be they will be duly advertised when matured. We hope to be able, in the course of a month or so, to take a series of negatives of artistic studies in this island, and shall then publish them in sets of five for half-a-guinea, printed by the carbon process, and varied perhaps with pigments. Should we in time succeed in rendering the process respectable in the opinion of critics, we may again try to arrange with Mr. Pouncy for publishing it. At any rate no further steps will be taken until better specimens can be exhibited; but even when the best that can be done for the process has been effected a carbon print will be of necessity *black*, and will not present an *albumenized surface;* but

an engraving or lithograph may be varnished, and so may a carbon print, by those who think varnish an improvement; which we do not.

In reply to our suggestion contained in a back number of the *Notes*, that development with gallic acid and acetate of lead might be useful for dry plates, Dr. H. Norris observes:—

"I am much obliged to you for the hint referring to development, but it does not apply to Dry processes. You will remember I asserted in one of my papers that over-exposure was necessary in the *Wet* process because the developing agents had the property of partially undoing the effect of light. This is especially the case with *pyro*, owing to the large amount of free acid *(acetic)* present. Will you try the effect of a drop of such a developer on a *washed* plate? Iron and gallic acid and acetate of lead develop the details *at once*. Why do we get such good detail with gallic acid? Because its power to destroy the latent image is very low. The same is true of *pyro, acetic acid* being *absent*. From a dry plate the *vapour* of acetic acid will remove the image "in toto." What we want then is something to restrain the pyro that has no action on the image. *Citric acid* is in this respect much better than acetic, so small a quantity is required. I must reiterate that both silver and acids remove the image, and this explains why, from a very acid bath, no details can be obtained. Now in these new modes of development we get the entire effect or nearly so of the *light*, by the old methods we lose a part; with our dry plates we get the entire effect and therefore cannot accelerate by these means. I can already reduce the exposure of my plates two-thirds, and I hope to get more, but my experiments are incomplete.

"I remain, yours very faithfully,

"Hill Norris, M.D."

We think the above remarks very excellent.

Will our readers kindly look over the list of words in the Advertisement of the Photographic Dictionary, and if they find anything of importance omitted favour us with their suggestions. It is not too late for any useful hints to be adopted, or words added, if necessary, in an appendix.

American photographers are in a state of ecstacy about a method of curing oggy nitrate baths by simply exposing them to sunshine, and the question now is, *who* discovered this wonderful dodge? Everyone says "I did!" of course. Now *we* must also join in the chorus, for the honour of old England and the *Notes*. At page 116, No. 24, for April 1st, 1857, this wonderful dodge was for the first time published.

A COMPARATIVE VIEW OF THE NEW ORTHOSCOPIC PETZVAL LENS, WITH THE ORDINARY SINGLE COMBINATION LANDSCAPE LENS.

BY ANDREW ROSS, OPTICIAN.

As the subject of the claim of Professor Petzval to the invention of the new Orthoscopic Lens, is now clearly before those who practise photography, through the medium of the published disputant letters of Professor Petzval and M. Voigtlander,—also that its prominent properties have been shewn in those plain synthetical papers published by the Editor of the *Photographic Notes*,—it may now be consistent for the practical optician to present, in distinctly a popular form, a comparative view of this novel invention with the ordinary form of landscape-lens, consisting of one combination only, the observations being derived from the practical construction and well-known theories of these different objectives.

Much has been vaguely said about the mathematics of this subject, which might lead those unacquainted with the practical construction of optical instruments to consider the complete and most perfect development of form and arrangement of such combinations to be the abstract production of the studio; but this is not so; for, however skilled and persevering Professor Petzval is in the resolution of the most abstruse mathematical formulæ, such as will form a new era in optical investigations, the Professor must have considerable practical knowledge of the propriety of arrangement in such instruments; for it is only by the combination of this latter acquirement that the mathematics could be rendered completely available.

The conditions of a landscape-lens having the maximum of practical perfection, are, that the chemical and visual foci of the optical combinations shall coincide; that the axial aberrations of both the central and the oblique pencils shall be balanced, that is, that all the rays of each pencil shall intersect its axis at the same point; and, resulting therefrom, together with the other corrections affecting the whole surface, that the optical picture (and consequently the chemical effect) shall be simultaneously equally depicted, free from linear distortion or perspective derangement throughout the whole screen.

Now, the erratic tendencies of the ordinary single combination landscape-lens which are opposed to these conditions of perfection, and which it is the chief object to correct, are,—that those rays of light principally producing the sense of vision, and those which act chemically, are differently refrangible;—that the image of a flat surface

produced by a lens, is a curved surface;—that the rays of light reflected from the object forming a pencil which, when converged by the lens, goes to form the picture of that part, do not all cross the axis of the pencil at the same point, and in consequence produce a confused or indistinct picture of it (this is called axial aberration);—again, that all perpendicular lines, or those which are nearly so, in the picture, except those which may pass through its centre, are more or less curved, and this is termed distortion;—that an excentrical pencil (or one, the course of which is directed by a diaphragm placed at some distance from, and usually having an aperture smaller than the semi-diameter of the lens) tends to place the subjects of the picture towards its margin proportionally nearer together than they are in the object, thus deranging the perspective of the picture. Another peculiar effect is produced in a camera-obscura picture which the single combination landscape-lens has no power to ameliorate, namely, the inclining of marginal perpendicular lines towards the centre line of the picture, which is referred to perpendicular perspective. This effect is not produced with ordinary vision; for in consequence of the natural narrow limits of its distinctness, especially in a lateral direction, each perpendicular line is made to pass through the centre of the picture on the retina (or nearly so) by the motion of the head or eye.

Now, in the construction of the ordinary landscape objective, consisting of one combination of lenses, the only *correction* which is produced by positive and negative qualities is that of the different refrangibility of the visual and chemical rays, and is affected upon the well-known principle of the compound achromatic-lens; when by similar management of the radii of curvatures, the chemical rays are compounded with the visual, and both are made to converge together on the screen where the picture is formed; but those other tendencies which are opposed to the perfection of the ordinary landscape-lens, namely, axial aberration of the central and oblique pencils, also difference of foci, for near and distant objects, and the curving of the surface of the picture, cannot be *corrected* by a single combination, but only *ameliorated* by diminishing the aperture in the diaphragm; while the curving of the marginal perpendicular lines and the effect of the perpendicular perspective, are not only entirely uncorrected, but both having similar dispositions of distortion produce the greater ill-effect. These are the optical properties in connexion with the single combination photographic landscape-lens.

We will now similarly trace the Orthoscopic construction, and review the effects of the second or negative combination, which by its opposite or negative properties tends directly to the correction of the erratic tendencies of the single combination.

The Petzval Orthoscopic combination may be considered as a construction of lens for transmitting small angular pencils of light, such only as are suitable for extensive pictures and landscapes. This is in contra-distinction to the portrait combinations, where the transmitted pencils are required to be large; and if the principles of construction of this latter were carried out to form a landscape-lens, the result would be a combination of extravagantly large dimensions. This new Orthoscopic-lens may then be consistently spoken of as a construction having the smallest possible combination for the specified purpose. It consists of two achromatic (or rather, chemically acting) combinations of lenses: the front one tends to converge the rays of light, and the back combination has an opposite property tending to diverge them, and is therefore called a negative combination. They are separated to about one-sixteenth of the focal length of the front combination; and the diameter of the pencil to suit the nature of the picture to be taken, is defined by moveable diaphragms near the back one. The rays then which diverge from the object are first converged toward a focus by the front combination; and, by the contrary tendency of the back, the focal length is prolonged to from once-and-a-quarter to once-and-a-half that of the first, where the picture is produced.

We must here introduce the observations, that with reference to a lens of small dimensions, an attempt to substitute a small single combination for the ordinrry form of landscape-lens has recently been made; but the original experiments being merely adventitious, and unguided by fundamental principles, the essay was soon given up. All experienced and correctly-informed opticians know that with one actinic combination of two or even three single lenses, cemented together at their contiguous convex and concave surfaces, however they may be modified, the above requisites of a landscape-lens cannot be produced; and it remained for the ingenuity and skill of Professor Petzval to accomplish the construction of the smallest possible arrangement by the introduction of a second actinic combination of such quality of focal power, and position in the instrument, that all the requisite corrections can be approximately accomplished. Again, the second combination being placed at some

distance from the front one, together with the peculiarity of that combination to diverge the rays of light, the foci of those converging pencils which are incident upon it, after emergence from the front, are prolonged, and this effect virtually produces a larger picture than is due to the back focal length from the negative combination, and that, in the proportion of the distance to which the rays emerging from the front combination are converging, to the greater distance they are made to converge to, after refraction by the second combination; consequently the saving in the length of the whole camera with relation to the size of the objects in the picture produced.

As this Orthoscopic lens consists of two achromatic (or rather, actinic) combinations, a more perfect and active effect in this respect can be produced; also by the property of the negative combination relatively prolonging the foci of the more marginal pencils, together with the opportunity of varying its curvatures, also its focal power, the other erratic tendencies of a single combination can be corrected. The restrictions to the correction of the axial spherical aberration of both the central and excentrical pencils, imposed by the ordinary combination, having its means of such correction absorbed in the production of an approximate flatness of field, are in this Orthoscopic one overcome; and the correction of axial spherical aberration effected to the second degree of approximation. The curving of the surface of the picture can also, by means of the negative combination prolonging the marginal foci, be directly corrected, while at the same time the curving of the marginal perpendicular lines making the straight sides of a square appear curved or barrel-shaped, as produced by the ordinary single combination landscape-lens, is by the same property corrected, as is also the derangement of the marginal perspective. This property of the negative combination to prolong the focus of the marginal pencils is likewise employed to ameliorate the effect of perpendicular perspective at the upper part of the picture; but as this perspective produces inwardly-inclined straight lines, and the tendency of the correction is that of outwardly-curved lines, although not producing geometrical exactness, considerably ameliorates the ill effect, which, together with the aid of the photographer in slightly tilting the camera and placing the horizontal line rather high in the picture, the visibility of this defect is nearly obliterated. With reference to the subject of the variation of the focal length of a lens in proportion to the distance of the object, this Orthoscopic lens is under the same optical laws as the ordinary single combination, and in this respect requires a suitable modification of aperture to produce distinct images of the various prominent objects in the picture situated at different distances; but the perfection of the corrections of the aberrations in this Orthoscopic lens, gives to each point of the picture a more perfect concentration of light than the ordinary one, producing quickness of photogenic action; but as this is accomplished by a second pair of lenses, light is lost by reflection at their surfaces: hence, upon the whole, the old form may be the more quickly acting lens.

In the employment of the means of direct correction afforded by this lens, the optician has to produce that amount of flatness in the picture which is suitable to the focal length, and consequently size, of the picture yielded by each individual lens; as in the practice of photography for landscapes, the focal length of the lens, or size of the camera, will be prescribed by the distance of the nearest object in the foreground, which must be distinctly shewn. As an example of this condition, our Orthoscopic lens, of $2\frac{1}{8}$-ins. diameter, and 16-ins. back focal length, is made to exhibit all the detail of a landscape in one focus, with an aperture at the second combination of $\frac{3}{4}$ of an inch diameter, when the nearest distance of the principal objects is 40 yards, and the greatest indefinite. For the grouping of objects the whole aperture of the back combination, namely, $1\frac{5}{8}$-in. may be employed, and the diaphragms with the smaller apertures for copying.

The superiority then of this Orthoscopic lens is that the actinic focus being more intense, and the marginal definition being nearly as perfect as the central, and the flatness of the picture under control, a freedom from distortion, and nearly perfect perspective over an angular picture of great extent, all of which can be produced by the experienced optician, with the elements of correction possessed by this new construction, together with the exterior advantages of the capability of combining a perfectly constructed portrait and landscape lens in one arrangement, and in one half the bulk as regards the landscape part, a reduction in the length of the camera for the size of the picture as compared with the ordinary one, and a corresponding diminution of price in both camera and lens.

These advantages are obtainable by the instrumentality of this double combination, and which no single cemented combination can accomplish.

We have just received an account of a camera-obscura lens recently patented by

Mr. Grubb, who expects it will be found more suitable for photographing views than any other extant.

The first argument in support of this opinion, is, by bringing his patented form of single combination into comparison with Professor Petzval's Orthoscopic lens, consisting of two combinations, with reference to their comparative quickness of photogenic action; and, secondly, that this patented lens has its spherical aberration nearly corrected, thereby affording, either a more distinct picture than the ordinary lens (if similar apertures be used), or an image as distinct as that given by the old lens, using a considerably increased aperture of the new.

In regard to the first argument, the representation might be strictly correct, as an ordinary single cemented combination can neither obstruct nor reflect so much light as one consisting of two combinations; consequently, on this individual point, the single combination would promise the quicker action. But the whole of the case for and against has not been shown. The Orthoscopic lens may, as before stated, be made to include more of the actinic rays than the single combination, and these can, in the Orthoscopic, be brought to more definite foci; hence, the comparative quickness of action of the two lenses is resolved into a balance of advantages; but my experience would dictate that the single combination would produce the quicker action with similar apertures.

His second argument,—that of the spherical aberration being nearly corrected,—is not to be granted as an improvement, unless it is shewn that other veritable conditions co-exist, the production of which has been previously understood to interfere with the correction of this axial aberration; but this has not been shewn; and in the course of my experience I have determined that when that indispensable quality of a consistent amount of flatness in the picture is provided, and which can only be procured by a bending of the combination, all other errors must remain as they happen, the means of optical correction provided by the single combination being exhausted; and when a certain amount of *flatness is obtained*, the lengthened and otherwise deformed focal points of the excentrical pencils equally ensue, the position of the lenses with reference to the picture being ultimately of little consequence; but as the greater command of the quality of flatness is obtained when the crown lens is toward the picture, we have continued that practice. Again, the claim that a "considerably increased aperture of the new lens" is afforded in consequence of the spherical or axial aberration being nearly corrected, which is at the expense of flatness of picture, we demur to; for even without this exception, the condition of aperture is dominated by others *in this single combination*. It is not the state of the axial aberration of the more central pencils that determines the diameter of the aperture to be employed,—it is the size of a pencil afforded by this necessarily imperfect lens which is sufficiently indefinite to exhibit a picture at the different distances resulting from the roundness of field or curving of the screen due to the objective, together with the different depths of the focal points arising from the different distances of the objects forming the picture. This latter limit of aperture is inseparable from the subject, and applies to the use of all lenses, in degree according to their properties; but Mr. Grubb leaves untouched that most important point of correct representation; for even if his second argument had any validity, the arrangement he has patented necessarily leaves all the geometrical errors without correction and as they happen, and which are fully described in the former part of this paper.

THE ORTHOSCOPIC LENS.

[*Letter from Professor Petzval to Herr Pretsch*]

TRANSLATED BY HERR PRETSCH.

To Mr. Paul Pretsch, in London.

I can assure you, my dear Sir, and I think you will agree with me, that amongst my many experiences I have never met a published article more remarkable in view of psychology than Mr. Voigtlander's letter, published in the *Photographic Notes* of May 15th. He behaves like an abandoned mistress whose love has vanished long ago, but whose frantic jealousy has been roused to the highest pitch, and he turns by his exertions in "virtuous" wrath his assertion of having known the new combination of lenses 17 years ago, to a perfect absurdity. There is no possibility that a practical optician could keep a lens of such superior beauty quietly and unused during 17 years, in spite of the want felt long ago; and people will consider this quite impossible of a man who shows such a temper as Mr. Voigtlander. One could rather grant that a hungry lion might leave a nice piece of flesh untouched in his cage during 17 years, because it is known that a lion is a beast capable of becoming drilled.

And for what purpose all his warmth in explaining matters which have no interest to the public, whether they are true or not? What does it matter whether Mr. V. had known a certain production of optics so many years ago, or not? The question at issue

is, does he manufacture good lenses, or bad ones? Are they good;—then they are valuable, even supposing he had only yesterday made their acquaintance; but are they bad, then they are valueless, even if he had known them a century ago. And it is precisely the same in all his innumerable statements and assertions. They have no interest for anybody whether they are right or wrong. Suppose (if it be as he asserts) that the first portrait-lenses had possessed a considerable chemical focus, therefore, having been decidedly unachromatic, and that he had considered it well to preserve this peculiarity,—then I say, "Very well; Dietzler manufactures better ones now, which are achromatic, and which have no chemical focus." If Mr. V. furthermore asserts that no learned corporation had declared as an absurdity his statement of having known the lens 17 years ago, then I reply, "This is not necessary at all,—common sense is perfectly sufficient to perceive this." If Mr. V. pays us both the compliment "that we together in conjunction would have been able to advance science and art considerably, and that we therefore should not quarrel together,"—then I thank him very much for the first part of his good opinion, and I perfectly agree with the second part; but he has been decidedly the assailant: otherwise, I certainly would not have mentioned his name. However, as I before observed, these possibilities have no interest for anybody. If we both had advanced science and art, it would indeed have been of some interest to some people; the bellows-treader might say to the organist "this *we* have done well," and not "this *you* have done well." Whether I am perfectly acquainted with the English language or not, is certainly a matter of no consequence to most people; and if I cannot find a difference between "unsuccessful" and "not quite satisfactory," I am obliged to add, that I cannot find out a difference at all in this notion in any language, or in any fact. The sentence in the letter of M. V. ("as for the camera alluded to in your Journal, the arrangement is no doubt very ingenious, like everything else invented by M. Petzval; but I do not understand why so complicated a camera is necessary, since very fine results can be obtained with the lens in question mounted in an ordinary camera") I translate briefly "very ingenious, but not necessary." If this sentence does not mean this, then it does not mean anything at all.

In his violent anger about a few words which I have mentioned concerning the misuse of my name during so many years, Mr. V. calls himself a gentleman,—I consider this not necessary at all. That ought to be a matter of course, and everybody can judge for himself from his style of writing; and if he alleges that he has inherited this rank from his father and grandfather that ought to be also a matter of course, because nobody can become such a high-bred gentleman without having due ancestors.

Somebody perhaps may think that the association of my name with the name of Mr. V. is only disagreeable to me, because he is not sufficient gentleman for me. I should not like at all that anybody should possess such a wrong notion of my character. I respect every honest man, and I am therefore obliged to declare that the mentioned association is diagreeable to me from another reason, viz.' because it is an untruth, that Mr. V. has worked according to my calculations,—and this is not only an indifferent untruth, but such a one as is practised for deception of the public;—a misuse of my name, and I am not only right, but it is my duty to oppose and contradict this.

Still worse is treated somebody else, who had said of Mr. V. that "he has played the part of a common workman in that affair." I myself have taken much trouble and have spent some money in furnishing a little workshop for the purpose of becoming myself a "common glass-grinder," and I am proud of my practical experience, gained by acquired exertions; but Mr. V. looks upon such cleverness with such a degree of contempt that he considers anybody as a calumniator who thinks him capable of such a thing. I must here confess that I myself do highly respect a good reliable glass-grinder;—if Mr. V. will not be such a one, very well;—I myself never did think him *such*.

This, Mr. V. calls "language of truth, which is often rough, like the path of virtue." But so little interest do all these matters possess for the public—so important do I consider the statement of a fact for the purpose of convincing everybody of the fact, viz., that Mr. V. does *not* work according to my calculations. He does not possess any formulas, or tables, and has not seen any of my calculations. Thinking this of some importance to the Photographic public, I may be permitted to enter here into some details.

There are two various modes of executing an optical production. The first one is the way of theory of mathematical calculation. But nobody should imagine that calculating for this purpose is a superfluous formality; on the contrary, it is the main point upon which everything relies. All the dimensions of the new optical production are taken from the principles of science, viz., radii of

curvatures, the distances of the lenses one from another, and the most careful accuracy is required, so far that two combinations of lenses of the same material—for instance lenses for telescopes—may not vary at all in their exterior appearance, nevertheless the effect of both may be so different that one is decidedly good, but the other decidedly bad; the small difference of 1 in the radii of curvatures being only perceivable by the finest measurement. It might be also observed that the optical material, the glass, is a body of no fixed optical properties or capabilities, but varying, and perhaps in a whole century optical glass is not produced twice of the same identity. Therefore the calculator is obliged to extend his calculations over all descriptions of crown and flint glass, to be met with in practice, viz., to make a tabula conformable to the purpose, the calculation of which requires a considerable expenditure of time, and intellectual power;—for instance a combination of two achromatic lenses requires the labour of four calculators during three months, if a complete tabula which may be relied upon, is desired. But if it is obtained, and we are enabled to command the means of science in its higher application for the purpose of investigating the proportions of the glass in refracting and dispersing; then we can find out without much trouble the dimensions of the apparatus to be executed in all the well-known descriptions of glass. It needs only a "common workman," a clever and honest glass-grinder, who is not willing to forge the radii of curvatures only for the purpose of correcting them afterwards again by his own "praxis,"—the result will be "quite satisfactory and successful." It does not need a gentleman, because he might be afraid of dirtying his kid gloves. But the value of the produce remains only as long as the store remains the same, and if this store is exhausted, there must be done from the tabula a new calculation, with all the renewed implements of practical execution, viz., moulds, patterns, grinding dishes, &c.

The second mode of execution is the Orthoscopical one. It is not so difficult, but it is supposed that somebody else must have executed the first one before. I have already given a complete description of it in my other letter, and it consists briefly in the following mode, viz.: the lenses calculated by Petzval, and ground by Dietzler, ought to be copied so accurately that there appears at best a difference of 3-ins., but a new graphic name for them must be added. It is possible that sometimes by accident anybody may obtain tolerable results in this Orthoscopic mode of production, with the difference founded on the nature of the matter, that the productions of a manufacturer working according to the principles of mathematics, are *always* of the same perfect quality, but those of an Orthoscopical workshop can only be of a very uncertain quality. It is therefore perfectly clear from this explanation, that only *such* an optician works according to a certain calculation, who possesses either the optical formula and tables, or who has the assistance of a mathematician in possession of these requirements. But any optician who has lost 17 years ago these tables, or this assistance, does not work any longer according to such a calculation. Mr. V. himself confesses that he is in no way connected with me; he confesses himself, furthermore, in another paper published in Leipsic, that he has not received from myself any tables or formulas, therefore he has stated an untruth in his price-list, and anywhere else, by announcing the words "according to the calculation of Professor Petzval," and an untruth which is confessed by himself, from which usage I hereby earnestly request him to desist. He may nevertheless reply to this request of mine, that several other opticians misuse my name in the same way, and that I cannot prevent this at all. But those are only the "common workmen," who walk on the easy broad main road, or who perhaps just wander into a comfortable path beside the "rough path of virtue," and who are not so particular in proving their gentlemanship by a pedigree of their ancestors. But a man like Mr. V. who speaks the language of truth, and walks on the rough path of virtue, and who is besides a gentleman, at first by himself, and secondly by his father and grandfather; such a man should not become guilty of an untruth!

Nevertheless this *has* been done till now, but only from a respectable affection of virtue, as his letter itself states; that is to say, only out of deference for the real inventor, and out of gratitude for the founder of his prosperity, and of his position in life. But I have never observed in him anything else than just the contrary of the symptoms of deference and thankfulness, because Mr. V. is forgetful, as he himself confesses. Therefore I am obliged to suppose that this deference is only to be seen in his price list, just beside the chemical focus;—in every other respect it has been perfectly forgotten;—but nobody, I should think, will believe his statement, that he has perfectly forgotten the lens. This would have had some possibility, if practical optics were rich in such productions. But this is not the case. This view-combination is unique. It has been a want felt since the

invention of photography on paper. Such a thing people are not apt to forget so easily!

For the purpose of preventing in future any conflict between Mr. V. himself and his virtues, I resign herewith most solemnly all my claims to his deference and gratitude, and he himself will kindly abstain from the use or misuse of my name, as I hope, that after this, my public declaration, the public will not believe any further, that he is working according to my calculations.

I request you to publish this letter as a reply to Mr. V's attack, or defence as he calls it, (judging from this, his defence, I should very much like to see one of his attacks), inserted first in Sutton's *Photographic Notes*, of May 15th, and at the same time, I must express my thanks to this gentleman for his very able popular explanation of the mode of operation of my new lens. Such sensible information, important as it is, escapes too often the inventor himself, occupied as he is, and stirring in nothing but integrals and mathematical problems. I consider these contemplations so valuable, that I am almost inclined myself to devote a part of my large work in three volumes, about Optics, for the propagation of more correct notions in that science. Even for the progress of science and art, such endeavours are of more importance than we may perceive at first sight.

The discord between Optics as an art, and Optics as a science, is an historical fact, in consequence of which each of them went their own way, without minding much the other one. If a man of *science* has discovered, by deep meditation, one of those marvellous productions, he has generally received but little assistance from practical opticians. Newton, Herschel, and Schröder, were obliged to construct their reflecting telescopes by themselves. We find only once, and as an exception, both of these qualities united in Frauenhofer, but they diverge afterwards very considerably. I, myself, experience the same fate, and have been obliged to erect for myself a small workshop, only for the purpose of digging out at least a few of the hidden treasures, which have been conjured into reality in numbers and signs by science,—because the greater number of optical artists alive in Europe possess very little sentiment for these marvels, and prefer to conduct their art rather on the comfortable Orthoscopical principle, than on the scientific way which is, at all events, a great deal more troublesome. The protection granted by the law to mental property, is perhaps not quite illusive, but it is so expensive, that it costs more than it is in reality worth. In consequence, under these circumstances, there remains only one remedy to prevent the degeneration of a new optical produce, constructed according to mathematical principles, viz., *informing the public*. This, however, will not finish Orthoscopical optics, but it will submit the same to more caution and care, and therefore they will be obliged to bring their produce nearer to mathematical art. The photographer, who knows exactly what a new lens ought to be, will not be apt to be too easily deceived by an orthoscopist. And if every misuse of the name of the real inventor cannot be prevented, still the same will at least lose much of its injuriousness.

I should like to have this letter published in some of the English papers concerned in these matters, and more so, as I think, that perhaps some judicious man of honour might be found who is able and willing to assist me in my efforts of propagating truth in Optics by means of popular information.

JOSEPH PETZVAL.

—We shall be happy to publish any communication from Professor Petzval relative to optical matters, either in this Journal, or in the form of a separate treatise.

We shall be much obliged to him to inform us what he considers the best form of condenser for a magic lantern, or dissolving-view apparatus: and also the best form of object-glass for these instruments.

We would also enquire of him to what extent he considers his Orthoscopic lens capable of being used as a copying lens?

Can he suggest any improved form of solar microscope, or solar camera? [ED. P. N.]

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

BAD COLLODION.

To the Editor of Photographic Notes.

SIR,—In your "Positive Collodion Process" you gave a formula, by following which I obtained beautiful pictures of GOOD DENSITY and *tone*; the collodion was Ramsden's, six months old, and *highly coloured*, the exposure about eight seconds; all went on well so long as the *old stock* lasted; the next purchase of *new* collodion gave pictures with one quarter the exposure, full of half-tone, but nothing like so *pure and white*, or the deposit *so thick*. Under-exposure is generally known by massive lights and blank shades, but with my *new* collodion I find it utterly impossible, by any amount of under-exposure, to get these extremes, the only difference between an under-exposed and a properly exposed plate being, that the former is *generally* darker, that is to say there is the same *proportion* and *relation* of light and shade as in the latter.

If the developer remain on for two minutes the high lights wont *thicken*, while, with a properly exposed plate the development is accomplished long before the developer has had time to tone up well; with my *old* collodion the point was to *prevent* thickening of the whites. I added a few drops of tincture of iodine to the new collodion until it was of the same tint as the old, but the pictures were still *thin* and *unsatisfactory*. Such is my experience always with *new* collodion, until it gets two or three months old. Will you favour me by explaining the *cause* and the *remedy*, for these *thin* pictures, (allowing as they do the black jet almost to show through), for they are a great nuisance. Short exposure is not so much a consideration as *density of deposit* and purity of tone; how are these to be obtained with *new* collodion?

And now allow me to say I feel a lively interest in the *Correspondence* portion of your Journal. I can assure you that what with the letters and your explanations I have got more *practical* information from them than from any other part, and this too is the experience of several of my friends here, who in common with myself have left off taking the "London Journal" because of its stately and ponderous articles. Science is very well in its way, Sir, but a practical *dodge* or two is worth all the science in the world. Let your journal be *really one* of "Photographic Notes and Dodges." Beware of those *grand articles*, however mighty the name or fine the style; depend upon it, by the majority, they are not read, and by the few seldom understood. Many men know too much to take good pictures, they have got so much science in them that they are obliged to have four or five guineas'-worth of practical dodging before they can do anything; and it is because your journal supplies these *practical hints* and *details* of manipulation that it is so much valued. It may be very vulgar, but when we take journals we want to get something we can make available, but whoever was one penny the better for an abstract optical or chemical article? It may interest you mathematicians, but to us there's "nothing in them."

Many thanks for *Humphrey's* extracts; they are rich in the extreme, and give satisfaction.

If you could draw him out on the gilding of glass positives, it would be a great boon to many of us. But I am encroaching on your valuable time, and will therefore draw up at once with an expression of my best wishes for the prosperity of your journal.

JAS. BARBROOK.

Bexley Heath, Kent, July 10th, 1858.

—We are very much obliged to our correspondent for his kind remarks, but do not quite agree with him in the matter of the "stately and ponderous articles." There is surely a good deal of *practical* wisdom in discussing the *theory* of a thing, because, when things go wrong one is better able to put them right by knowing the why and wherefore of the matter. Science is nothing more than generalization; it is in fact the connecting thread which strings facts together, and shews how they all depend on some one simple principle.

The real *trash* in the journal he alludes to is (in our opinion) to be found chiefly among the "dodges." Nevertheless, the practical value of a really *good* "dodge" to a professional photographer is worth ten years' subscription to any journal. We are fully aware of this, and endeavour to let nothing that is really good that we happen to become informed of through any channel escape our notice in this journal.

Now, with respect to the query about the collodion: When collodion is properly made it ought to work well the very day the pyroxyline is dissolved in the ether and the iodizer added. The only advantage of keeping it a day or two is to allow the undissolved particles of gun-cotton to settle to the bottom of the stock-bottle. When the acids used in making the pyroxyline are too strong, and the temperature too low, the collodion is hard and impenetrable like a skin, and produces blisters, and does not adhere to the plate, or combine with the chemicals. With such collodion the only remedy is to iodize it, and let it get old and partially decomposed: then it becomes more porous, adhesive, and easily impregnated with the chemicals, and sometimes works better. Mr. Ramsden knows this, of course, and our correspondent has perhaps got hold of some of an unfortunate batch. Photographers are greatly indebted to Dr. Hill Norris for first pointing out *clearly* and emphatically the proper conditions to be observed in making pyroxyline. Mr. Hardwich's observations on this subject are also very good, and his reasoning founded on careful experiments and close observation is in general very convincing. [ED. P. N.]

CAUTION TO MAKERS AND USERS OF PHOTOGRAPHIC CAMERAS AND SLIDES.

To the Editor of Photographic Notes.

SIR,—I observe in your last number a letter headed, "Caution to dealers in and users of Photographic Glass." I wish to caution *Makers and Users of Photographic Cameras and Slides, &c.*, on the same point. I have used Dr. Hill Norris's Dry Process for the last two years, or nearly so, and in my hands, it has succeeded admirably, except in a few instances, in which I have found a straight line right across the sky of my picture. I used every precaution, (as I ignorantly thought), such as black bags, &c., in vain.

I turned the camera. The line then appeared across the *ground* of the picture, or, in other words, exactly in the same position *with regard to the slide.* Exactly opposite this line, there was in the slide a *white linen* hinge, and this white linen hinge, I am assured, by repeated experiments, was the cause of the line in my picture. The line only appeared in those pictures which had been left some days in the slides before or after exposure.

Your obedient servant,

"DRY COLLODION."

P.S.—In order to be quite sure that no pencils of light found their way through the linen, I tested it in a dark box, against a blazing sun at noon.

—Some seven or eight years ago we bought our first view-camera from Messrs. Knight, and have it still in good order; it takes pictures 12×10. The shutters of the slide are hinged with a piece of black flexible stuff of some kind, very ingeniously let into grooves in the two parts of the shutter.

With these slides we have *frequently* observed the dark line across the negative exactly opposite to the hinge of the shutter, as described by our correspondent, and some of these negatives are still in our possession. It proved a most annoying circumstance, and unaccountable, because no light can get through the hinge, to all appearance, and our sensitive paper had at this time a glass in front, which protected them from any supposed radiation. The fact is, actinic rays can pass through a screen which is opaque to luminous rays! The shutter of a dark slide should always be hinged with brass, and a light-tight rebate. Our correspondent has done a good deed in bringing this matter forward. But our friends in Foster Lane must not suppose we attach any blame to them, for who on earth could have anticipated so curious a result; but no more of these ingenious hinges should be made.

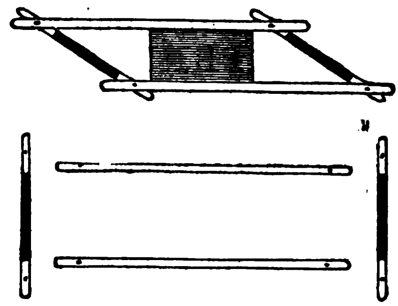
[Ed. P. N.]

A PLATE-HOLDER.

To the Editor of Photographic Notes.

Sir,—I herewith send you a plan of a Plate-holder, for holding the plate during the process of cleaning, which I believe is the *best, simplest*, and *cheapest*. If you are of the same opinion, you are at liberty to publish the same in the *Notes*.

The holder is made, as the plan shows, out of four pieces of oak wood, with a groove only deep enough to catch the edge of the plate, say barely the eighth-of-an-inch down each side, and the corners to work on moveable joints, not too free. A plate can be cleaned either two inches or two feet square by a plate-holder of this description by simply placing an india-rubber ring on the corners



opposite the hand in notches made for that purpose; and by merely turning the wrist both sides can be cleaned without removing the plate from the holder. J. Armstrong.

27, Lyon Street, Caledonian Road, Islington.

—The above appears to be a very good plan.

[Ed. P. N.]

"*T. G. Opie.*" The best whites are obtained in the Positive Collodion Process by acidifying the bath with *nitric* acid, one drop to the ounce of bath, and using a developer composed of proto-sulphate and proto-nitrite of iron, acidified with *nitric* acid. See our treatise. The developer should be used as fresh as possible. [Ed. P. N.]

"*R. Taylor.*" The iodizing solution has probably been kept in a strong light and become deteriorated. Alcoholic solution of iodide of ammonium should be kept in total darkness. The same remark applies to iodized carbon. [Ed. P. N.]

☞ *The Communications of "Stereoscopic," "J." and "W. J., Leeds," will be given in our next*

PHOTOGRAPHIC NOTES.

ALSO

SEVERAL USEFUL TABLES.

☞ *The work does not include the account of such well-known common forms of apparatus as may be seen at any of the principal photographic depôts; as this would have occupied space unprofitably.*

Photographic Notes.

AUGUST 15, 1858.

AMONG the various applications of Photography there is probably none in which the public would be more deeply interested, could it be accomplished, than that of exhibiting stereoscopic pictures upon a screen in such a way as that *a considerable number of spectators* might each *at the same time* perceive a single solid picture. M. Claudet has lately, to some extent, solved the problem by his new and ingenious instrument the "Stereomonoscope," to which we alluded in a recent number, but we believe that in this case only some half-dozen or so of spectators standing at a short distance from the ground glass screen can enjoy the stereoscopic illusion at the same time. In No. 3 of this Journal the subject of rendering the stereoscope available for purposes of public exhibition was we believe for the first time brought forward in print. That is about two years and a half ago, and since then we have at different times turned the matter over again in our mind, but without being able to strike out any new or happy idea. Very recently, however, a paper was communicated to the French Academy of Sciences by M. J. C. D'Almeida, in which some ingenious and possibly valuable hints are thrown out. Two methods are proposed by this gentleman, and they proceed upon the correct principle that the left eye must only see the picture taken from the left station, and *vice versa*. We need hardly observe that the idea at one time entertained, that by throwing *both* the stereoscopic pictures upon *one* spot, and looking at the confused jumble thus produced with *both* eyes a single stereoscopic effect could be produced, is now abandoned as erroneous. Here then are M. D'Almeida's two proposed methods of applying the principles of the Stereoscope to purposes of public exhibition;—

First method. — A pair of transparent stereoscopic positive prints are exhibited by means of a pair of lanterns, and the magnified images thrown pretty nearly upon the same part of a white screen; (which of course produces confusion). A red glass is placed between the condenser and slide of the right hand lantern, and a green glass between the condenser and slide of the left hand lantern; the red and green being complimentary colors. The spectator then wears a pair of spectacles, in which the glass before the right eye is red, that before the left eye green. In this way the left eye only perceives perfectly the green picture from the left station, and the right eye the red picture from the right station. The result is a single stereoscopic image, probably of a dirty drab colour; since *artificial* greens and reds are not the PURE green and red of the solar spectrum which by their combination produce *white* light.

The above plan is correct in principle, but would probably fail in practice for the reason assigned.

Second method. — This plan consists in throwing intermittent images upon the screen, first from one lantern, then from the other, at the same time that the instrument through which the spectator views the images has a corresponding apparatus by means of which a shutter is brought before the left eye when the right picture is on the screen, and *vice versa*. In this way a single stereoscopic effect is produced.

The latter plan may perhaps involve some practical difficulties, but it seems to us more likely to answer the required purpose than the former one, tho' both are equally original, ingenious, and correct in principle.

We shall return to the subject of the stereoscope in the next number, and describe an extremely simple method by which anyone ignorant of the rules of perspective, and with but little headwork or difficulty of any kind, may from any given painting (Mr. Frith's Derby-Day for instance), produce the outline of another picture, which, when painted similarly to the first, shall be capable of yielding a single stereoscopic picture when the two are viewed in a pair of reflectors. We have actually applied the process to a large chromo-lithograph, and produced from it a duplicate in oil colours, such, that when the two are exhibited in the reflecting stereoscope a single beautiful solid image is obtained. We shall strictly fulfil the promise now given in the next number, and lay before our readers a plan which is at once simple and perfect, and which we really believe may some time or other be extensively adopted by artists, and constitute a new era in art. The second picture is of course different in its outline from the first, and the problem solved is *really* that of obtaining a perspective view from a station different from the point of view of the original picture of *all those objects which are visible from both stations;* and it will be remembered that *only* such objects or parts of objects as *are* visible from both stations can be united in the stereoscope;—for instance, a cow seen round a corner from one station cannot be united with a wheel-barrow seen round a corner from the other, because all such

objects as are not visible from *both* stations are mere phantoms in the stereoscopic image, and not only have no *solidity* but absolute *transparency*.

The reader will find in the present number an account of our photo-yachting trip to the coast of Brittany.

Mr. Pouncy's Carbon Process formed a subject of discussion at the last meeting of the French Photographic Society. In reply to the objections which have been urged against this process, we can, *from actual knowledge of it*, express our confident opinion that it *will* give, and *does* give, as good definition and half-tone as any other process upon plain paper, that it will prove to be the very thing most ardently wanted by sensible photographers, and that when fairly brought into operation it will supersede all other methods of printing. We deliberately commit these strong opinions to print and abide the consequences.

We have received from Mr. Larkin, of Litchfield, some choice stereoscopics. The interior of Canterbury cathedral is superb; we have seen nothing finer in photography; everyone should add it to his collection; our readers are referred to the advertisement for particulars.

We are happy to announce that a new Photographic Society is about to be established at Wolverhampton, modelled after the plan of the flourishing and useful Society of Birmingham, whose active assistance and co-operation was readily and willingly given to its Staffordshire brethren.

The Council of the Birmingham Photographic Society are contemplating the establishment of a "Permanent Exhibition of Photographs," in the noble old hall at Aston Park, the managers of which have kindly offered a room in the building for that purpose. We admire the enterprising spirit of this Society, and wish them every success in their earnest endeavours to promote the art.

The following hint may be useful to those who are working wet collodion during the present hot weather:—The other day, in order to ascertain how much absolute alcohol might be added to collodion, we took an ounce of ordinary plain collodion, and added to it first an ounce of absolute alcohol, (S.G. ·794), and then four grains of pyroxyline, which dissolved completely. On iodizing this collodion in the usual way, a picture was obtained equal in all respects to that taken with the original collodion. Now this result is very curious, because it would almost appear as if the alcohol, and not the ether, was the principal agent in dissolving the pyroxyline. It must be particularly observed however that the alcohol in the above experiment was *absolutely anhydrous*, and not the so-called absolute alcohol sold by chemists, which contains water and would certainly not succeed. In hot weather, with collodion actually boiling when poured upon the plate, (which happens at about 110°), this addition of absolute alcohol would no doubt be found highly serviceable, and the matter should certainly be followed up. We shall repeat our experiments and report results; but would once more caution our readers that the "absolute alcohol" sold at the shops is generally S.G. ·820, and experiments made with *it* are *certain* to end in failure. The alcohol must positively be *anhydrous*.

We have received from Messrs. Anthony, of New York, two bottles of their dry collodion, for trial, and shall have something to say about it in our next. We have also received "the Photographer", M.S. Photographic Journal, an abstract of which will be given in our next, and the Journal passed on without delay.

The report of the proceedings at the last meeting of the French Photographic Society will appear in our next. M. Girard stated that he had tested one of Mr. Pouncy's prints, and found it to resist the prolonged action of concentrated nitric and hydrochloric acids, aqua-regia, cyanide of potassium, cyanide of potassium with iodine, and alkaline sulphides, none of which energetic agents affected it in the least. On the same occasion M. Humbert de Molard stated that he had found uranium prints not a whit more stable under the action of hypo or cyanide, than common silver prints, and he believed their supposed permanence to be a mistake. He also observed that this process contained no new principle, being the same in principle as the iron process of Sir John Herschel, published in 1842. In our opinion the uranium process is merely an expensive modification of known processes, and we advise our readers not to trouble their heads about it.

Mr. Davidson, optician, of Newcastle-upon-Tyne, informs us that in 1841 he obtained a gold medal from the Scottish Society of Arts, for a lens the counterpart of that which Mr. Grubb has lately patented! Our readers will understand with respect to Mr. Grubb's lens that it is as old as the hills, and contains no new principle. A landscape lens *must* be of the *meniscus* form, and the *only* problem is how to *achromatise* it. There are two ways of doing this, both of which are included in our

formula, as shown in No. 55, and both of which have been tried by most opticians, who have given the preference to the common form for certain *practical* reasons. As for spherical aberration, *it has to take its chance* in an achromatized meniscus, and is cured by the stop. Whoever professes to cure spherical aberration in a view-lens otherwise than by the stop must be set down either as an ignoramus or an impostor. As for the remarks of Mr. Shadbolt, in his last Number, they are simply those of a person whose previous studies evidently do not render him competent to deal with a subject of this kind, or to act as an instructor to others. No other reply to them, from us, is at all called for.

LOG OF A PHOTO-YACHTING EXCURSION TO THE COAST OF BRITTANY;

BY THE EDITOR.

There are probably few of the readers of this Journal who have had the good fortune to enjoy the combined pleasures of a photographic and yachting excursion, in the height of summer, to a romantic and interesting locality; I have therefore no doubt that a brief account of a trip from which I have just returned, and which proved in every way most delightful and satisfactory, will be read with interest,—particularly as I have received *carte-blanche* from the hospitable owner of the yacht and my agreeable *compagnons de voyage*, to mention the full particulars of the expedition.

Well then, on Monday morning, July 26th, the beautiful fore-and-aft schooner yacht "Rosalind," of 101 tons, made her appearance off St. Brelade's Bay, and her gig, manned by four strapping rowers, and steered by the owner, Mr. Birchall, of Preston, came ashore and took me on board. I had to start at a moment's notice as the vessel was laying-to in a heavy sea a mile outside the bay, and under reefed sails; but I had everything ready and not an instant's delay occurred. I took with me a stereoscopic camera, six or eight dry plates which I had received from Dr. Hill Norris nearly a year ago, and a stock of clean glasses for working wet collodion, all the other paraphernalia being provided by Mr. Birchall. The stereoscopic camera is fitted with a pair of portrait lenses, with stops of various sizes from $\frac{1}{8}$th of an-inch upwards, capable of being inserted between the front and back lenses of the combination;—the lenses being mounted $2\frac{1}{2}$-inches from centre and having a focus of 4-inches measured from the back lens. This form of instrument I consider the best, because in the first place it is strictly correct in theory, and in the next place instantaneous pictures can be taken by removing the stops and fixing a front shade to the camera to prevent the effects of diffused light.

We had rather a stiff pull on board, and the long, narrow gig, propelled at full speed by the rowers, leaped merrily from wave to wave without shipping a drop of spray. Should any nautical reader enquire why the vessel laid-to so far outside, I would inform him that this coast, although beautiful to look at, is beset with dangers in the shape of rocks and tides, and to approach it too near without a pilot in a vessel drawing 11 feet of water is an act of which no prudent captain would be guilty, for ships' bottoms are not exactly calculated to withstand much bumping upon Jersey granite.

Some little dexterity is always required in getting on board a vessel from a boat when rolling in a heavy sea, because there is a chance of the boat being stove-in; but a yacht's crew is expected to be particularly dexterous in all manœuvres of this kind, and there certainly never was a finer set of men than the ten well-disciplined and good-tempered fellows who compose the crew of the "Rosalind"; so the word "in bow" was given at the proper moment by the steersman, oars unshipped, boat-hooks and fenders put out, and the gig brought alongside the lee-gangway, through which we jumped on board one after the other as the vessel gave a lee roll, clawing hold of a couple of beautifully white cotton ropes fastened to brass stanchions, and scrambling up a mahogany step ladder. The helm was then put up, the sails filled, the weather fore sheet let go, and away we went, close hauled on a wind, for the Isle de Brehat, on the coast of Bretagne, distant some fifty or sixty miles from Jersey. In the course of half-an-hour or so the wind moderated, the sea went down, the sun came out, and so the reefs were shaken out, and a gaff-top-sail set upon the main-mast. Then my dear little island soon began to look blue and hazy, and at one o'clock the steward announced "lunch." Our party in the main cabin was a quartette, my three companions being all Preston gentlemen, two of them Aldermen, the third a Clerk of the Peace, so I found myself in august society. As the vessel heeled over considerably under the press of sail we were carrying, the swing table was brought to an amusing angle with the floor, so that while my plate nearly touched my chin, that of my *vis-à-vis* was literally upon his knees and at arm's length from his mouth; but the freaks of Old Neptune did not appear to spoil the appetites

of any of the party. In the afternoon the wind went down entirely, and we had a roasting sun and a flat calm, the sea looking as if it had been oiled. As the flood tide was running strong and drifting us towards a reef of rocks called *Les Minquiers*, the captain thought it prudent to anchor, so there we lay until about seven o'clock, midway between Jersey and the French Coast and nearly out of sight of land. But the sun went down somewhat suspiciously, and the weatherwise predicted wind and rain before many hours. Dinner was served at six, and we turned into our berths at midnight just as a light breeze was springing up.

TUESDAY, JULY 27.—I was aroused this morning at six from a profound sleep by the rattling of the chain-cable through the hawse-holes, and on enquiring, found we were anchoring in the roadstead at Brehat. This is an island lying close to the main land, and about two or three miles long and a mile wide, but of very irregular form, and surrounded with rocks of all shapes and sizes. It was pouring with rain and blowing very fresh right in to the roadstead, nevertheless we determined after breakfast to go ashore, so mackintoshes were donned, the gig manned, and away we pulled for the little harbour. I must not forget to mention however that the "Chef des Douaniers" first paid us a visit on board, and after a great deal of jabbering in French a small fee was paid *pour la santé*. Mr. Birchall had been once before to Brehat, so he took us direct to the great curiosity of the Island, viz., a remarkable old church and church-yard well adapted for photographing. But the weather was so bad that nothing could be done that day; so we returned on board, eat, drank, played chess, and cleaned plates, and thus whiled away the hours till bed-time.

WEDNESDAY, JULY 28.—Rain and wind again. I was pronounced the "Jonah" of the ship, for on the Monday I had brought with me a flat calm, and ever since we had had rain and wind;—in fact we were all as sulky as bears. About two o'clock however it left off raining, so although the light was bad we determined to try our luck at photography, rather than remain idle and out-of-temper on board. I took with me my dry plates and stereoscopic camera, and Mr. Birchall a camera for views 9 × 7, and all the wet collodion paraphernalia. We got an out-building close to the church-yard, hung up yellow cloths before the window, and employed two of the crew in carrying water, cameras, &c. It was nearly four o'clock before we began work, and the light was very bad. I exposed one dry plate ten minutes with a ½-inch stop, and another half-an-hour. Mr. Birchall's first wet plate, exposed three minutes, gave only a grey and feeble sky; but the bath was too acid, so we added some carbonate of soda and tried again; the second plate, with a longer exposure, gave a decent positive quite free from fog. These first attempts were not encouraging, so we returned on board and spent the evening as usual. At midnight it was a flat calm and the weather seemed improving.

THURSDAY, JULY 29.—A fresh breeze and cloudy sky, but with patches of blue in it, and the weather evidently clearing up; so arrangements were made to go in the gig with all the photographic traps to Beauport Abbey, a fine ruin, situated at the head of a creek about three miles from our anchorage. We took with us a large tent, and the chemicals, cameras, &c., packed in a huge basket, and started immediately after breakfast. The wind was fresh and on the beam, so a sail was set upon the gig large enough to have capsized her in an instant had not six out of the eight persons on board sat well to windward, and then it was exciting in the extreme to see this long, narrow boat, five or six times her beam, tearing through the water against the tide (and with a good lop of sea on outside the headlands which we had to weather) without shipping a single drop of spray. I mention these performances of the gig because I hold certain theories with respect to the construction of boats and vessels which I intend some day to publish in a pamphlet on the mechanics of sailing boats. My idea is that speed is to be obtained by means of *length*, the height of the sails and rig depending not upon the length but the beam, so that a long vessel is not necessarily more crank than a wide one, since it may be considered as equivalent to two or more wide ones fastened together fore-and-aft; at the same time I believe that modern experience has established the fact that a bluff bow is a wet, and a sharp bow a dry one; but this Journal is hardly the place for discussing questions of this kind.

Somehow or other we mistook the landing-place, and surprised a party of ladies from the neighbouring town of Paimpol, in the act of making their toilet after a bathe. One of these, whom we dubbed the "blue lady," from her wearing a blue polka, excited the particular admiration of one of our party, as we gathered from his frequently turning his eye-glass in her direction and from the dreamy and sentimental mood in which he indulged until he had paid Paimpol a visit on

the following morning, which appeared to dispel the romantic illusions of the previous day. For my part I have somehow got to regard *everything*, even the *pulchrum sexum*, in a photographic point of view, and my first thoughts are always how to get a good pose, or make a good composition; now this is an abnormal state of mind which ought not to be encouraged. Certain it is however that the "blue lady," tripping about upon the wet beach with shoes and stockings off and lower garments clued up, hunting for shells, or sea-weeds, or shrimps for her aquarium, and surrounded like Nausicaa with her attendant nymphs, would have made a charming study for the camera.

Having mistaken the landing-place we had to cross another creek on foot, and to wade through the mud for about a mile, two of the sailors carrying the traps slung from the sprit of the boat. One of the men, nicknamed "Toby," (as handsome a fellow as one often sees, and a Hercules in build,) was with Lord Dufferin a year or two ago, on a yachting trip to the Arctic regions.

We got to Beauport Abbey about 2 o'clock, and at once pitched the tent under some trees. It was a lovely afternoon,—cloudless and calm, and the ruins of Beauport far surpassed my expectations. Strange to say this part of the coast is beautifully wooded and the scenery of a pretty inland character, altho' the tide washes the Abbey grounds. I worked up two or three more dry plates, and also took two or three stereoscopics upon wet ones. The chemicals were in good order, and Mr. Birchall got three or four exceedingly good negatives. The tent he worked in is on the military principle,—that is, it has a pole at each end, and is fastened to the ground with ropes and pegs, so that when up it resembles a high pitched roof with two gables, through one of which you enter, and in the other is a yellow window. The plan is very good when there are two men always at command to shut you in, let you out, and so forth, but otherwise I hardly approve of it. My ideas on the subject of a tent shall be given in a future number.

This successful photographing put us all in good humour, and we had a glorious sail back to the yacht, arriving in time for a roast goose at 9 p.m.; and ending the day in a very jolly manner. Just before turning-in I went on deck to look at the weather. There was absolutely no wind, the stars were twinkling, and the sea calm as a mill pond, while upon its surface, appearing as if sown broadcast were a thousand rocks, large and small, which now scarcely provoked a ripple, and on the land side the funny little Island of Brehat with its amphibious population. And beneath my feet lay the beautiful "Rosalind," asleep upon the water, with her tall raking masts, and taught rigging, and luxurious appointments; and in their berths her intellectual and hospitable owner, and our agreeable companions—the gentleman dreaming of the "blue lady," and the musician of the party, (of whom more to-morrow), and the skilful captain;—and in their hammocks the gallant crew, and the glorious old cook, who was never seen on deck after six in the morning, and the obliging steward,—all in fact but the "anchor watch," the one man forward, chewing his quid in a red nightcap. It was a scene never to be forgotten; and such as makes us wiser and better men, beyond a doubt.

Friday, August 30.—Aroused this morning at an unearthly hour by an unusual wishing-washing-slushing-scraping-scrubbing over head, for altho' the decks were scrubbed divinely every morning, it was thought proper on this particular occasion to make an unusual business of it. All these operations on ship-board, together with the strange noises one hears,—for instance, the gurgling of the water close to one's ears all night, the creaking of the bulk-heads, groaning of the masts, tramping over head, thumping of ropes on deck, and rattling of chains, are very exciting; and then the tossing and tumbling one gets, one-half the night over to leeward in one's berth and down where the keel ought to be, and the other half up to windward, with the fear of being pitched out bodily, and having to hold on "like grim death" ; — the novelty of all this sort of thing has for me a peculiar fascination, for I do not often suffer from sea-sickness, and heartily enjoy anything in the shape of adventure; as, in fact, do most people.

The sun was shining brightly, and from that moment to the end of my trip I do not remember that a single cloud crossed his blessed disc. We determined to make one more trip to Beauport, and take some more views, while the other two of our party went off to Paimpol. The first two or three plates did not turn out quite so well this morning, and one of them was decidedly fogged from alkalinity of the bath, but a few drops of acetic acid put matters right at once, and then the chemicals worked beautifully, the process being reduced to a dead certainty. I worked to-day on my wet plates, and got some nice little stereoscopics, and Mr. Birchall did capitally on his 9 × 7 plates, so that all went "merry as a marriage-bell."

The Abbey of Beauport belongs to a French lady who married lately a Polish refugee.

The site has been chosen with that keen appreciation which the old monks appear to have possessed for fine natural scenery; and it is not difficult to understand why men of educated minds and quiet habits should in dark and troublous times have congregated together in remote and beautiful spots, as far away as possible from the tumult of a badly-governed, fighting, squabbling world, and lived on the produce of the rich and smiling vallies which surrounded their common dwelling,—not however exactly like angels, or entirely free from the vices and weaknesses of humanity.

This evening we were all in glorious spirits with the day's work. I have said that one of the party was musical. He is in fact an accomplished musician and singer, and either is or was president of a glee club in the North. This evening then we had a musical *soirée*, and never did I enjoy "Tom Bowling," "Sam Spritsail," "Fly not yet," "The Thorn," and several of Tom Moore's and Burns's immortal songs so much as when rendered by Mr. Burnett on this occasion. His execution was full of "fine detail" and "half-tone," and in finish and taste perfect. Between the songs we were favoured with some vocal harmony from the men for'ard, some of whom have good voices and musical tact. Then followed speechifying, returning thanks, and similar jollyfication, which we kept up till after midnight and concluded with a song or two on deck. That evening will ever be with me "a green spot in memory's waste." Our kind entertainer is a noble fellow. "May his shadow never grow less."

Saturday, July 30.—This day was spent in Brehat, taking the old church and church-yard over again from various points of view. We worked in the tent, and everything came out capitally. When one has all the paraphernalia at hand there is no process like wet collodion. The church-yard is full of wooden crosses, painted black, upon which the name of the departed is inscribed; a bottle of holy water is placed at the foot, and on the back of most of them are painted flames, pointing upwards, and a skull and cross bones; at the end of every inscription is added; *Priez Dieu pour le repos de son âme!* I got some good stereoscopic negatives of this church-yard, and have no doubt they will be very effective when printed. Many of the graves are planted with flowers, and some with weeping willows. Fortunately not a leaf stirred, and our negatives are sharp and perfect.

This was our last day in Brehat. The island has but little interest and the houses are stiff and ugly. The population during the summer months is composed principally of old men, women, and children, most of the young and able-bodied men being at sea. There are several good houses upon it inhabited by *capitaines de long cours*, who have realized an independence at sea.

Sunday, August 1.—We started at three o'clock this morning for Roscoff, a small town situated on the coast near Morlaix, and about 60 miles from Brehat. An old pilot took us as far as the Isle de Batz, and then another came on board and took us into the roadstead of Roscoff. The wind was right aft, and we bowled away at about 9 knots, with square-sail and square-top-sail set upon the foremast, so that I had the pleasure of seeing the "Rosalind" in "full feather."

It was a glorious sail. We passed in succession the Heaux lighthouse,—the Seven Islands,—a dangerous reef of rocks called the Triagons,—and then came in sight of the lofty spires of Roscoff, and of the magnificent Creisker and Cathedral of St. Pol de Léon,—the Spire of the Creisker being rather higher than that of Salisbury, or the cross of St. Paul's. An amusing and exciting incident occurred when passing the Seven Islands. A large French government cutter, accompanied by two smaller cutters, came so close to us, as to enable Mr. Birchall and the captain of the large cutter to exchange courtesies by a wave of the hat. The Frenchman was close-hauled, and we were running with the wind right aft, the most unfavourable point of sailing for a fore-and-aft schooner; but after having saluted us he bore up, and gave us a race, setting all the sail he could upon his vessel, viz., square-sail, gaff-top-sail, and half-top-sail, In half-an-hour we left him a mile astern, and saw him haul down his square-sail and half-top-sail, *defeated*.

The "Rosalind" is built somewhat on the model of the "America," and is one of the fastest yachts afloat. She has only raced once, and then carried off the cup. Every sailing craft we came in sight of was beaten "into fits," and many of the large trading cutters which ply between France and Jersey, and carry provisions, and frequently live-stock, are fast and fine vessels,—but these and other craft when on the same tack with ourselves were generally left "hull-down" in a couple of hours.

The coast of Brittany, which we were now skirting at a distance of six or eight miles, was once in a high degree a land of romance and sanctity. Here King Arthur is said to have had his encounter with the dragon, and the Bretons dispute with Glastonbury the

honour of possessing his remains;—at the same time the numerous ruins of fine ecclesiastical buildings in this part of France bear witness to the former sanctity of this locality.

We anchored in the roadstead of Roscoff in the afternoon, took a stroll to the Isle de Bätz, and went ashore at Roscoff in the evening. The church has a tower and spire, built in the time of Louis 14th, which struck me as singularly elegant, and I regret exceedingly that we could not find time to get a photograph of it. About a mile from Roscoff, in a garden formerly belonging to a convent of Franciscans is an immense fig-tree, probably the largest in the world. The branches are extended laterally and supported upon stone pillars. I measured the diameter of the space covered by it as nearly as I could by stepping it, and the distance was twenty-three long strides, so that three-hundred people could probably stand beneath this tree. It was loaded with fruit.

In the neighbourhood of Roscoff great quantities of onions, asparagus, and other vegetables are grown for the English market, and these are conveyed across the Channel in a kind of lugger called "Chasse-Marée."

Monday, Aug. 2.—Started at eight this morning in a most wonderful French trap for St. Pol de Léon, a distance of three miles, taking all the photographic apparatus with us, and the useful man "Toby." Put up at the Hotel de France, equi-distant from the Cathedral and Creisker, and got a room there to work in, so the tent was unnecessary. The tower of the Creisker is a marvellous piece of architecture, running up straight like an Italian Campanile to the height perhaps of 200-ft. or more, and then terminating in a spire, the entire height being 393-ft. It is of elegant design. We got three or four successful views of it, both on the 9 × 7 and stereoscopic plates. The best view of the upper part of the spire is got from a stage on the top of the Hotel de France. The Cathedral offers nothing remarkable in its exterior, except a rose window; but the interior is very fine. Since my return home I have received from Mr. Larkin, of Lichfield, a stereoscopic view of the interior of Canterbury Cathedral, which is so perfect that I greatly regret its not having occurred to me to try the interior of the Cathedral of St. Pol de Léon. There are some curious skull-coffins here. The practice was to disinter the body some years after burial, cut off the head and place it in a small box like a dog-kennel, having a cross on each gable, and a hole in the shape of a heart at one end through which the skull is seen. Outside is an inscription commencing thus: *Ci gît le chef de* ——, and ending with: *Priez Dieu pour son âme.*

We returned to Roscoff by the same ricketty conveyance in the evening; but too late to take the elegant tower of that place. I would observe that in the corner of the church-yard at Roscoff is a curious building, unlike anything I have seen before, and which I believe to have been an ossuary, or place for containing the bones of those bodies from which the head was removed to be deposited in a skull-coffin.

Tuesday, August 3.—Got under weigh this morning at eight with a fair wind for Jersey, and were soon bowling along at ten knots under square-sail and square-top-sail, as on Sunday, which we considered a piece of extraordinary good luck. This was to be the last day of my holiday, and my kind friends, who were anxious to witness the approaching ceremonies at Cherbourg, were going many miles out of their course for the express purpose of putting me ashore at Jersey. As the spires of Roscoff and St. Pol de Léon, and the various objects on the French coast receded from view I took my leave of them in a sort of mournful reverie from which I was aroused by a cheering proposition from Mr. Pedder, the naturalist of our party, to try and obtain a portrait of Mr. Birchall on the deck of his yacht, with the bulwarks, sails, &c., for a background. In this matter there appeared to be no difficulty, for although the vessel was tearing through the water with all the sail set she could stagger under, and tossing and rolling right merrily, still as the camera moved with her, her particular motion during the exposure was of no consequence; so we darkened the after cabin skylight with black and yellow curtains and got to work. Mr. Birchall stood in the shadow of the mainsail with a telescope in his hand, and the background as it happened, and a No. 2 Ross portrait-lens was brought to bear upon him. On focusing I could discover no traces of diffused light, for the precaution had been taken to place a diaphragm of about 1½-ins. aperture immediately in contact with the front lens, which cut off the ring of light generally seen round the edge of that lens when working in the open air without a shade to the front of the camera. The operation therefore offered no difficulties, and out of three trials two excellent full-length portraits were obtained with an exposure of two seconds in the shade. We next took three or four stereoscopic views of the vessel from the stern, including the captain and crew, (save the man at the helm), together with my three cabin passengers.

These came out admirably with an exposure of twenty seconds and the ½-in. stop between the lenses. Then followed an attempt to take the waves instantaneously. It was now six o'clock. I knew it would be of no use to employ the full aperture of the portrait lenses, as my stereoscopie camera is badly constructed and lets in diffused light when no stops are employed, so I tried with a ¾-in. stop between the lenses, and gave an instantaneous exposure by quickly uncovering and re-covering the lenses by a black glazed hat. The sky came out quite dense and the horizon well-defined; the distant waves were also sharp and crisp, but the near ones under-exposed and devoid of detail. The sun was at my back; there was no fog on the plate, and the lines of the picture are intensely sharp. I have no doubt whatever but that with a properly constructed camera, and lenses properly mounted so to prevent diffused light from entering and permit of the whole aperture being used, the waves of the sea might be taken in broad daylight with great ease and certainty. In fact photography may, *I am quite certain*, be turned to a most useful purpose in navigation; I mean for taking the marks described in books of sailing directions, and also the various appearances presented by the coast, while the vessel is under weigh. The governments of civilised countries should take this matter up at once. It would doubtless save many shipwrecks, and prevent much suffering and loss of valuable property. I conceive this matter to be so important that I purpose in the next number devoting a special article to the consideration of it.

We did not save our daylight into Jersey, and therefore lay-to outside the dangers of the coast until daybreak the following morning, when we ran in and anchored in St. Aubin's Bay.

I found all well at St. Brelade's, and heaps of letters requiring my immediate attention. To my kind friends Mr. Birchall, Mr. Pedder, and Mr. Burnett, I am indebted for a delightful holiday, rendered intellectual by photography, natural history, and music; and to the skilful captain of the Rosalind, Mr. Trout, for some valuable information in nautical matters, and many amusing anecdotes of trips to Iceland, Norway, the West Indies, &c., &c. All this enjoyment, and my introduction to these kind friends, who have given me a pressing invitation to visit them at Preston, was brought about by Mr. Birchall breaking a bottle of collodion on a former visit to Jersey, and applying to me to replace the loss. Among my readers there are probably few who have not made some valuable acquaintances, or even esteemed friends, through photography.

I took my last look at the beautiful "Rosalind" on Wednesday afternoon as she passed St. Brelade's on her way to Cherbourg.

The 10th commandment has not the especial clause "Thou shalt not covet thy neighbours yacht," but in the "nor anything that is his," I suppose the yacht is included; I must not therefore covet the possession of the beautiful "Rosalind"; but if there is any thing on earth I should like to possess, it is a yacht big enough to take me on a photo excursion to the Mediterranean. Five or six years ago I built, in my own garden, a schooner of forty tons on the model of a trading vessel, the hold being fitted up temporarily with bulk-heads and cabins, and in this little craft took a few trips to France, but the *res angusta domi* compelled me to dispose of her and give up marine pleasures.

And now I must bring a long story to an end, with an apology to the reader for having trespassed perhaps too long upon his patience. I would observe however, that the collodion we used was my own make, after the formula of Mr. Hadow, given in my Treatise, and iodized only with iodide of potassium; and that we used both acetic and citric acids in the developer, Mr. Birchall giving the preference to the latter.

Since my return home, I have developed two of the dry plates. The first was under-exposed, the second quite successful. It will be remembered that these plates have been kept for nearly a year; there is no fog, the blacks are extremely dense, and the definition perfect. Dr. Norris's process is really admirable; it deserves to be recommended extensively, and is a great step in photography. [Ed. P. N.]

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

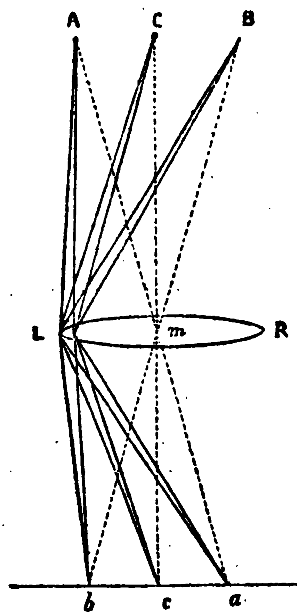
The Members of the above Society will hold their first General Meeting of the Winter Session, at their Rooms, Odd Fellows' Hall, on Tuesday evening, August 31st, 1858.

A Paper will be read by Mr. Harrison Branthwaite, on "the Chemistry of Photography," illustrated by experimental manipulations, showing the easiest and simplest method of testing the purity of the chemicals used, together with the mode of finding the strength of the nitrate bath, &c.

The subject of this paper being of such high importance and utility to Photographers of all classes, it is hoped that there will be a large attendance of Members.

A QUESTION IN OPTICS.

The old discussion about the different perspective views of an object given by the different parts of a large lens, which we thought had been completely set at rest by our article in No. 41, has been lately revived in a new penny Journal, called the "Public Instructor." We are compelled therefore in self-defence to endeavour to put the matter, if possible, in a clearer light than before.



L R is a large lens or combination, corrected for spherical aberration; C c its axis; A, B, two bright points symmetrically situated with respect to the axis, and in the same plane with it. A large pencil from A covers the lens and comes to a focus at *a*; similarly a large pencil from B covers the lens and comes to a focus at *b*. These points *a*, *b*, are, of course, symmetrically situated with respect to the lens, and at an equal distance from it, and from the axis. Since the lens is corrected for spherical aberration, all the rays of these large pencils are brought accurately to foci at *a*, *b*. (See the Report of the Jury in Mr. Ross's advertisement).

This being understood, let a focusing screen be placed so as to pass through *a*, *b*; and let there be another bright point C, so situated upon the axis of the lens as that the focus *c* of a large pencil from it may fall accurately upon the focusing screen, midway between *a* and *b*. The point C will then be *further* from the lens than A and B, and will not lie on the line which joins A and B: but above it, so that A, C, B, form a triangle. (In the figure this triangle is too flat, in consequence of a mistake of our engraver. C should be ¼-of-an-inch above the line A B.*)

Now we come to the point at issue.

When the whole lens is employed, the images *b* and *a* are at an equal distance from *c*. What happens then when we cover up all but a small portion of the lens at L? Do the images change their position by this manœuvre and become a perspective view of the points A, B, C, as seen from L? They do not. They remain exactly where they were before.

For in the case of the large pencil A L R, *all* the rays come to a focus at *a*, and therefore the small pencil A L, which is a part of the large one, comes to the same focus at *a*. Similarly with respect to the other small pencils C L, B L; they have their foci at *c*, *b*, as before. And if the lens had been covered all but a small portion at R, the images of A, B, C, would still be at the same points *a*, *b*, *c*.

It matters not therefore what part or parts of the lens are employed,—the images are always formed at the same invariable spots upon the focusing screen, viz., *a*, *b*, *c*.

Now we come to Sir David Brewster's story of the different perspective views. According to him, the images of A, B, C, obtained upon the focusing screen when a small portion of the lens at L is used, are a perspective view of those points as seen from L. But in that perspective view A and C would appear *nearer together* than B and C, because A B C is a triangle; while in the images upon the focusing screen *b* and *a* are at an *equal distance* from *c*. The picture given by the margin of the lens at L is therefore NOT a perspective view of A, B, C, as seen from L; so that Sir David Brewster is wrong

Paley says, when a theorem is submitted to a mathematician, he tries it upon some simple case, and if it breaks down he knows it at once to be wrong. Sir David's theorem has now been tried upon a simple case, and it breaks down, and is wrong.

Can anything be clearer than the above demonstration? Surely no one out of Bedlam will be found to dispute it.

Professo Kelland has said something about Sir David's "phraseology." If a man says black is white, it is an error of phraseology, but his phraseology should certainly be corrected; it cannot be allowed to pass. [ED. P. N.]

ON THE TREATMENT OF NEGATIVE NITRATE BATHS THAT ARE OUT OF ORDER.

If a negative nitrate bath for collodion is simply alkaline, acidify it with *acetic* acid, adding a drop or two at a time, and testing it with litmus paper between each addition of acid.

If too acid with *nitric* acid, add so much of a solution of carbonate of soda as is necessary completely to neutralize the nitric acid, or even to render the bath alkaline, and then acidify it again with *acetic* acid. On first adding the carbonate of soda a yellow turbidity is produced, with effervescence; this is due to the formation of carbonate of

* The figure is very imperfect; the lines A R, B R, C R, *a* R, *b* R, *c* R require to be joined.

silver, which is speedily re-dissolved and carbonic acid liberated. As soon as the carbonate ceases to be re-dissolved, the whole of the free nitric acid is neutralized. On adding acetic acid the carbonate of silver is decomposed into acetate of silver and carbonic acid. A small portion of the acetate of silver (which is a white salt insoluble in water) is then dissolved by the nitrate of silver in the bath.

Never add ammonia to a negative bath, and never use the ammoniacal salts in photography, (except the iodide for collodion positives, and even in this case it is a question whether iodide of potassium is not better). The salts of ammonia are all very unstable, from the volatile nature of ammonia, which causes it to escape from its compounds. Besides, ammonia and nitrate of ammonia are solvents of oxide of silver, and generally ammonia forms complex and unstable compounds in the nitrate bath.

Sometimes the bath fogs the plate and is nevertheless acid;—and it commonly happens that a new bath fogs and works badly. When a bath is in this state it requires energetic treatment.

1st. Expose it to sunshine for a day or two, with a piece of muslin tied over the neck of the bottle. This will precipitate most of the organic matter in combination with sub-oxide of silver. Then filter the bath without disturbing the precipitate, add a little nitric acid, boil it down in an evaporating dish on a sand bath, and recrystallize it. The crystals of nitrate of silver may be mixed with crystals of nitrate of potass or other salts, but impurities are removed by crystallization, and unless these salts exist in great excess they may be harmless. Redissolve the crystals in pure distilled water, and try the bath again.

2nd. Throw down all the silver in the bath as a brown oxide by adding liquor or potassæ to it. Wash the oxide in several waters, dry it, and roast it in a crucible. In this way organic matter will be burnt off and the oxide reduced to sub-oxide or metallic silver. Re-dissolve it in nitric acid, evaporate, and crystallize.

3rd. Throw down all the silver as a yellow carbonate by adding carbonate of soda to the bath. Wash it well in several waters, roast it in a crucible as before, re-dissolve it with nitric acid, evaporate and crystallize.

Should these plans fail, throw the silver down with salt as chloride, and send it to the refiners, (Messrs. Johnson, of Hatton Garden), who will give pure silver in exchange for it, making of course a fair deduction for their trouble.

We advise photographers to make their own nitrate of silver for the negative bath. The plan is to obtain pure silver from the refiners, pure nitric acid from a respectable chemist, and to make their own distilled water with a large glass retort, and a Liebig's condenser. Then they will know it cannot contain lead or organic matters. All that now remains is to dissolve the silver in the nitric acid. This is done by adding to it a sufficient quantity of nitric acid, diluted with three parts of water; it is of no consequence if the diluted acid be in excess. It must be done out of doors or under a chimney as suffocating fumes are given off. The water is necessary in order to oxidize the silver. When the metal is dissolved the solution must be evaporated and crystallized; or if it be thought desirable to drive off the whole of the free nitric acid the crystals may be fused; but this renders them alkaline, probably because a little oxide of silver is formed and held in combination with the nitrate; the remedy is acetic acid. A bath thus made is pretty sure to act well at first. In cases where a bath acts badly at first, either the nitrate of silver, or the distilled water, or both, must be in fault.

Distilled water, so called, is frequently nothing but filtered rain water, which has been collected in leaden tanks, and holds oxide of lead in solution, besides other impurities. The lead may be detected by *pure* sulphuric acid, which renders the water cloudy. [Ed. P. N.]

ON THE MICROSCOPIC EXAMINATION OF PHOTOGRAPHS.

(Extract from Humphrey's Journal.)

"Friend Humphrey.—In my investigations of Photography, with reference to its application to the production of the reduced drawings of our maps, I have found it necessary to commence a set of microscopic examinations of the collodion films and images with reference to the sharpness of the impression.

"In futherance of this object I lately, when in New York, purchased a microscopic photograph of the "Declaration of Independence." This photograph was made by Mr. Langenheim, of Philadelphia; it is about the size of the head of an ordinary dressing-pin, and contains nearly 8,000 letters in all. I selected this object for examination because I knew that this kind of Photography required the utmost clearness in the work and cleanliness in the operations to get even a passable result, and again, because I knew that Mr. Langenheim's long experience and extensive practice as a photographer guaranteed me a fine specimen. Moreover, I chose one by the aid of an achromatic microscope, from out of a lot of the same, that I might have the best.

"Photographers talk about "sharpness." But, what is sharpness? Since I commenced my investigations, sharpness is no longer to be found; I could show them things that would make them stare. But, as these micro-photographs are pre-eminently sharp, and as Mr. Langenheim has so justly deserved the high reputation he has obtained for the clearness of his pictures, and as they stand unrivalled for beauty, I will try to give the fraternity a view of the microscopic appearance of one of the sharpest of all photographs.

"Under a power of 100 diameters this minute bill already becomes readable. It has the appearance of being printed with extremely small and exquisitely neat type, on a pearly white paper. There is a sharpness of outline and clearness of definition that defies description, and gives the whole an appearance of neatness that never could be obtained by means of types and ink.

"At a magnifying power of 250 diameters every part of the letters is distinctly visible. The whole appears about the size of two pages of Humphrey's Journal, or rather larger. But already with this power the letters are showing up their defects; they are no longer neat, but blurred, and occasionally broken. The impression produced on the eye is that of being printed with worn out type on poor paper.

"With higher powers the defects increase both in number and extent. But ordinary good achromatic microscopes do not go much beyond this; and here the majority of those who may wish to pursue this matter must stop: only those who can have access to those microscopes which have become world-renowned for their power can witness the wonders which lie beyond.

"I now transferred the photograph to the stage of the great microscope made by Mr. Spencer for the Smithsonian Institution. This microscope has not its peculiarity in a high magnifying power, for that is easily obtained in any microscope—but in the wonderful penetrating power, from the great angle of the aperture of the object glass which Mr. Spencer has succeeded in giving to his instruments. Penetration, or aperture, in a microscope is what a bright sun and clear atmosphere is to the view of the landscape; but, without penetration, though the image be made ever so large, it will be like looking at an object in the night, in which we see only the general form and not the minutiæ.

"At 500 diameters, with the Smithsonian instrument, the edges of the letters are serrated and many detached pieces appear by their sides. Only a few of the letters appear in the field at a time, but each letter is quite large and by no means handsome. You might imagine that the printing had been done from some old wood-blocks on which some juvenile candidate, for the reputation of having a genius for carving and sculpturing, had been amusing himself by hackling their edges and whitling off the corners, and this on a paper previously used by a colour dealer for wrapping up lamp-black.

"With a power of 900 diameters the letters are gone; only the ruins can be seen. I fear I cannot give you an idea of the appearance. The dots of the i's and the crosses of the t's are but clusters of large black spots, interspersed and surrounded by multitudes of black specks, and this is the character of every bar and curve of the letters. You cannot tell a *c* from an *o*, except by considering the general form of the aggregation. No part of the spaces between the letters appears white; everywhere the black specks are seen. I think you might form some conception of the appearance, if you were to imagine that the floor was strewn with black pebbles and sand, and then you were to rake it up somewhat into the form of large letters.

"GEO. MATHIOT."

EFFECT OF LIGHT UPON WHITE LEAD AND IVORY BLACK.

(Extract from Humphrey's Journal.)

"I was reading in a late Journal an article, by M. Niepce de St. Victor, upon various sensitive substances, and it recalled to my mind a circumstance that occurred during the past winter.

"We were painting a background with white lead and *ivory black* in water; after giving it a finishing coat, we placed it before the window where the sunlight shone through and rested upon it. It had been there but a few minutes when my partner called my attention to it, by saying that there was a picture on the background. On looking at it I found that the window-sash had been reproduced on it, the sash being dark and the spaces between where the sunlight rested were lighter. This, we supposed, was only because the moisture had dried out more in the light parts, and thought nothing more about it until some days after, when the screen was *entirely dry*, we found the impression still remained, and much more distinct than before. In fact, it was so distinct as to show in negatives, and we were obliged to paint it over again to get rid of the impression. Perhaps some one of your readers may have seen something similar, and can inform us further on the subject.

"F. B. GAGE."

WHOLE LENS STEREOSCOPE.

To the Editor of Humphrey's Journal.

In the last number of your Journal you publish the proceedings of the French Photographic Society, from which it appears that M. Claudet claims, in opposition to M. Hermagis, to be the inventor of the Whole Lens Stereoscope, and that he received a patent for it on March 8, 1855. Now, my object in writing is to remind you and your readers of the fact, that I received a patent for the "Stereoscopic Daguerreotype Case," embracing precisely this same invention, March 8, 1853, just two years prior to M. Claudet's alleged discovery; and, by reference to your Journal for June, 1853, you will find a description of the same. My stereoscopic case was on sale as early as July, 1852, and you will find, by inspecting a case presented to you, by me, in the fall of 1852, that the lenses therein are *whole lenses, and two and a-half inches apart from centre to centre.* Precisely the advantages claimed by M. Claudet for his stereoscope are those I have endeavoured, for the last five years, to impress upon the minds of artists and the public. Hence, the editor of *Cosmos* was right when he "thought the invention had been published in America prior to the date of M. Claudet's patent."

—The foregoing, as must be apparent to every American photographer who peruses it, is from the pen of our industrious countryman John F. Mascher, who is familiarly known here as our most scientific investigator in relation to stereoscopes. No one will for a moment doubt that this gentleman was the first to employ the "Whole Lens Stereoscope."—ED. H. J.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

To the Editor of Photographic Notes.

DEAR SIR,—Would you be kind enough, either through the *Notes*, or by letter, to inform me what

the Architectural Photographic Association are doing I subscribed more than a couple of guineas to the undertaking, and have never got any pictures. I have written several times and always get a polite evasive answer. The last communication was about a month or more ago, when they asserted that *no photographs* up to that date had been delivered, but that they expected to do so in a week, of which due notice would be given. Surely there is some mismanagement.

ISAAC WHITESMITH.

5, Cumberland Place, Glasgow,
July 24th, 1858.

—The printing of some two or three thousand prints has no doubt proved an almost insurmountable difficulty by the delectable present method of printing. Events have turned out exactly as we predicted they would in a private letter to Mr. Hesketh; and when subscribers get their prints they will probably find them all fading before Christmas; if, indeed, they get them by that time. Until the present method of printing is completely swept away no important object of the kind contemplated by the Architectural Photographic Association can be realized. But the death blow to this process has been struck by Mr. Pouncy, and if the Association should exist another year their object may be better accomplished, for photography is about to leap forth from its swaddling clothes, and the bandages which have been wrapped tightly round it by short-sighted and selfish persons. Before many months have passed over our heads an immense impetus will be given to photographic operations, and an important new branch of industry erected by the introduction of carbon printing. Of this we feel ABSOLUTELY CERTAIN. In one week from the date of the publication of Mr. Pouncy's carbon process, whenever that may be, the present methods of printing will be swept away like chaff before the wind. Knowing as we do the particulars of this process, the trumpery objections that have been raised against it and the puny impediments that have been thrown in its way are to us a subject of immense amusement. Photographers do not think this process worth a shilling; very well; let them go on in ignorance of it a few months longer, and spend their time and many shillings upon filthy fading prints; they will some day tell a very different story, and the Architectural Photographic Association be relieved from its peck of troubles. In the meantime matters are not standing still with Mr. Pouncy and his process; of that our readers may rest assured. [ED. P. N.]

MR. GRUBB'S PATENT LENS.

To the Editor of Photographic Notes.

SIR,—Having, in the journal of the Photographic Society, No. 61, p. 251, described several lenses made by me for Photographic purposes a few years ago, and being under the impression that Mr. Grubb's Patent View-Lens is no novelty, I am glad to find my opinion supported, not only from the number of gentlemen who have privately written to me upon the subject, but also from the plain simple formula given in the *Notes*, pages 169-70, and which you say was given to the public *six months* before Mr. Grubb applied for his patent.

This form of lens is as *old* as the achromatic lens, and if formulæ were wanting to prove this, I *know* they may be found among many, in the record of every learned Society in Europe.

Mr. Grubb claims what he never ought to have patented, and indeed his specification is so very brief, that even if his patent is good, opticians can hardly tell how far they can go without infringing Mr. Grubb's *invention*. Mr. Grubb ought to have given the exact radii of the posterior and anterior curves of his lenses, together with the refractive index of the glass he uses, &c., to make his specification intelligible to all.

Your obedient servant,

THOMAS SLATER.

136, Euston Road, August 4, 1858.

BACKGROUNDS.

To the Editor of Photographic Notes.

SIR,—I have been often asked by amateurs and others, what kind of a background is best; and for a long time I had great difficulty in satisfying myself with one. I have at length discovered a plan, (which so far as I am aware is original), that suits my purpose very well. It is simply this:—I have canvas stretched upon a frame, and painted light brown; this comes out a light grey background in my picture, and it suits a good many sitters. Then I have a black velvet curtain, hung by wooden rings on to a rod along the top of my background. I draw this curtain across my background by means of a cord that passes beneath the floor; when I let go the cord the curtain is drawn to one side by means of a weight. In proportion to the time I keep this curtain drawn across my background, so is the background dark or light. I can modify it to any shade between light grey and black. This contrivance is so simple and suitable that I believe were it properly known by professionals it would be generally adopted.

I send you a photograph on leather of the upper end of my glass house, with the velvet drawn half-way across the background; you can perceive the cord by which it is pulled fixed to the camera stand, and the end of it loose on the floor.

If you think this worthy of insertion in your Journal, you are welcome to make use of it, and I shall feel happy to give any further information that may be needed.

JOHN STUART.

88, Glasford Street, Glasgow.

—The collodion positive forwarded to us by our correspondent is superb. What developer did he use?

We have just been informed of an admirable mode of producing graduated backgrounds, which we shall publish as soon as we are permitted to do so by the inventor. It is impossible to imagine anything better. [ED. P. N.]

"*J.*" Try the negative development with proto-sulphate of iron.

With respect to the discolouration of a nitrate bath containing lemon-juice, we are at a loss to account for it, because it sometimes happens to us, and at other times does not. At one time we attributed it to the presence of iron in the bath, from pins having been dipped into it; but that notion was probably erroneous. The blue discolouration of the nitrate bath has no doubt some connexion with the blue tint of negatives when the developer contains citric acid. It is impossible to remove the blue tinge from the bath either by filtration, or kaolin. It does no harm when only existing in a slight degree. [ED. P. N.]

"*W. J. Leeds,*" complains that his toning-bath has turned quite black, and that prints upon albumenized paper, although very strongly printed, are immediately obliterated by being immersed in it. If his bath is old and weak in hypo, and he has lately added a strong dose of chloride of gold to it, that might account for the annoyance. At any rate he should make a fresh bath. No one now-a-days uses old black toning-baths.

The best way to treat an old black hypo-bath is to add photo-sulphate of iron and acetic acid to it. The precipitate then consists of metallic gold and sulphide of silver; and the clear liquid when boiled down and crystallized, the double salt hypo-sulphite of silver and soda, which is reduced by intense heat first to sulphide of silver, and then to a button of metallic silver. Proto-sulphate of iron throws down metallic gold from any solution which contains it.

Mr. Parsons, of Leicester, informs us that a gentleman he knows has succeeded very well in electro-plating with an old hypo-bath. We imagine it to have been the clear liquid containing the double hypo-salt of soda and silver from which the silver was obtained. Old hypo-baths should never be thrown away. [ED. P. N.]

"*Stereoscopic*" puts the following questions:—

"Would you, or any of your numerous readers, kindly inform me whose water-colours are the best for painting stereoscopic paper proofs; and what liquid is used with the paint in mixing? I have used water and the white of egg, neither of which seem to answer the purpose. The colours look opaque and muddy instead of looking bright and clear.

"Could you recommend me any work that is published, giving instructions how to paint stereoscopic paper proofs?"

—We advise him to try the addition of a little purified ox-gall to his colours. [ED. P. N.]

PRESERVATIVE PROCESSES.

"*An Amateur.*" We advise you to have nothing to say to the formula which you enclose, believing it to be wrong in principle for this reason, that in developing a *washed* collodion plate the pyro-gallic and acetic acids, applied *alone*, not only do not develop the image, but actually *destroy* it; there must be free nitrate of silver either in the film or in the developer, or no image can be produced, but on the contrary the latent image on the iodide of silver is actually destroyed by the developer; this fact Dr. Hill Norris has completely established. Besides, the preservative solution you allude to contains *honey*, and also *albumen*;—now it is a decided mistake to use honey as a preservative, because honey contains *two* kinds of sugar, one of which is *grape-sugar—a powerful reducing agent*, and therefore to be avoided as a preservative; which should be an inert substance like gelatine, or glycerine. We have never once in this Journal recommended the use of honey in photography, believing it to be wrong in principle, and we now say emphatically, *it won't do!* If photographers will turn their backs upon the sensible and correct dry preservative process of Dr. Hill Norris, and daub their plates with a syrup, let it be golden treacle, and not honey, for golden treacle is uncrystallizable, and does not contain grape-sugar. Observe, also, that no preservative solution should contain an acid, as oxymel does, because an acid destroys the image produced by light, and renders the process insensitive to a degree, and eats up the half-tones and details in the shadows. Dr. Hill Norris has laid down the correct principles of preserving collodion plates;—his various papers on this subject should be studied carefully, and his instructions followed implicitly. As for albumen it contains sulphur, and is not so safe a preservative as gelatine. We advise our correspondent, and all our readers, to have nothing more to say to syrups, or oxymel, or albumen, but to employ Dr. Norris's excellent process, and none other. Experience has now proved that this process fulfils strictly ALL that has been said with respect to it, and the thanks of mankind are due to its discoverer. We have never advocated the use of syrups, and consider them now as nearly exploded from photography. Every sensible photographer with whom we have compared notes on the subject of syrups has agreed with us that the syrup dodge has been made a bore and a nuisance, and is quite worthless. [ED. P. N.]

"*N. Flaherty, Ballyfoley.*" To take instantaneous pictures a portrait-lens must be employed, with full aperture, or, at any rate, with a very large stop. Examine the image carefully on the ground glass for diffused light, when exposed out of doors, and try whether shading the upper part of the lens with your hand appears to remove fog and give brilliancy to the blacks of the image; if it does, remove the ground glass, throw the black cloth over your head, and see whether the edges of the lenses show a ring of light, also, whether the inside of the tube reflects light, and whether the sides of the camera are lighted up nearest to the ground glass. If these evils exist, it will be found impossible to obtain a good instantaneous picture; and the remedies are as follow:—

Insert a diaphram inside the camera, rather smaller than the picture, and nearer to the lens, so as to cut off all light reflected by the sides of the camera, without intercepting any of the light that produces the image. This diaphram may be made of stout millboard.

Next, paste an annulus of black paper about a ¼-of-an-inch or half-an-inch wide upon the circumference of both the back and front lenses of the combination. This cuts off the rings of light, and reduces the fog considerably. It unfortunately diminishes the effective working aperture of the lenses, but that can't be helped;—the practical optician is now pulling one way and the practical photographer another;—let us hope that some day they will both pull together.

Next, line the inside of the tube with black cotton velvet.

Lastly, add a shade to the front of the camera,—that is to say, continue the camera as far as may be necessary in front of the lens, by means of a box fitted to it, and which has a round opening in front, and a side shutter through which the hand may be inserted to turn the focusing screw.

The process employed should be wet collodion iodized with iodide of potassium alone. (not iodide of cadmium) without any bromide or chloride; and the picture should be developed first with iron, till all the details appear,—then intensified if necessary with pyro and silver acidified with citric acid.

If the above instructions are followed implicitly objects *well lighted* may be taken instantaneously without any difficulty. Should any of the darker details hang fire, a second negative should be taken with a longer exposure, and one part of the positive printed from one negative, the other part from the other. [ED. P. N.]

"*G. Bird, Tollerton.*" Your microscopic subjects are very satisfactory. An account of the process would greatly oblige us. [ED. P. N.]

"*R. Peers*" is thanked for his communication. [ED. P. N.]

"*H. K.*". See Dr. Hill Norris's paper, in *Notes*, No. 37. [ED. P. N.]

Photographic Notes.

SEPTEMBER 1, 1858.

We have for some time observed with regret that no distinguished mathematician (Professor Wheatstone excepted), should think it worth his while to express an opinion on the vexed question as to the proper distance between the points of view in taking stereoscopic pictures; but that subject of regret is at length removed; we have been favoured with a communication relating to Stereoscopic Photography (which the reader will find in the present number, signed A. B. G.), from a gentleman who holds one of the highest scientific appointments in Europe, and is one of the most distinguished Senior Wranglers of Cambridge. This communication will doubtless be read with much interest, and the opinions expressed be considered as decisive of the question at issue among photographers.

To us it has always appeared that the stereoscope is an instrument capable of answering a double purpose. In the first place it affords the means, by taking the pictures from stations wide apart, of representing objects in greater relief than they appear to have in natural vision; and this application of it may not only be highly useful in science, but may also in certain cases possess considerable interest in an artistic point of view. In the second place, by taking the stations 2½ inches apart, and viewing the pictures through the same lenses as those by which they were taken, and at the same distance from those lenses, the exact effects due to natural vision may be realized;—for be it remembered that in natural vision the binocular effects of relief are confined to near objects, and cease when the objects are situated at a certain moderate distance from the eyes. Bearing these principles in mind the photographer may proceed according to the particular purpose which he has in view. Two different truths may in fact be realized by the stereoscope;—one is the reproduction of the effects perceived by natural vision;—the other the reproduction of effects of relief where relief actually exists, whether that relief can be perceived by unassisted natural vision, or not.

We would call the attention of our readers to two advertisements in the present number,—one headed "Photographic Society of Scotland,"—the other "Leeds Photographic Society." It appears from the former that the Photographic Society of Scotland offers two silver medals, one for the best photograph exhibited at their approaching Exhibition in the winter, and open for general competition, the other for the best photograph exhibited by members of the Society. We admire greatly the spirit in which this has been done, but fancy some little difficulties and troubles may arise out of it. From the latter advertisement it appears that the Leeds Photographic Society intends to open an Exhibition of Photographs in connexion with the proposed Meeting of the British Association in that town. We trust that photographers will respond to this appeal, and that Photography will be properly represented at that Meeting.

We had prepared a somewhat lengthy article for this part of our Journal, in which some curious and possibly important new processes were described and discussed. That paper has unfortunately been detained on its road from our study to the Printing Office, and we cannot at the last moment insert it in the present number.

Messrs. Anthony, of New York, have sent us for trial some of their Collodion for the Dry Process. This Collodion is said to require no preservative solution of any kind, but merely washing off the free nitrate of silver. We have tried it both in the ordinary wet process, and also with the washed and dried plates, and in both cases it answers perfectly. It is equal, in fact, in all good qualities, to the best collodion by English or French makers.

If Mr. Shadbolt cannot yet understand our article in No. 49, we advise him to take it to Professor de Morgan and get his help. If the Professor should find anything wrong in it, we will publish his opinion in this Journal. As for replying to Mr. Shadbolt's objections, if the truth must be told we do not consider them *worth* a reply. When he apologises to us for the use of the term "jesuitical," in an opprobrious sense, we will think over his charge of want of "gentlemanly courtesy" in our having said he was no mathematician. We dislike the word "*gentlemanly*"; it frequently includes in its meaning a vast deal of selfishness, folly, and want of principle. Let us have truth, honesty, candour, and a man's heart in the right place, and we will try and put up with the want of what is "gentlemanly."

Since writing the above remarks, we have seen Mr. Shadbolt's article in the last London Journal. We can only say that our demonstration of the theorem to which he alludes will be found strictly correct by any mathematician who will look it over. As for his objections, they are altogether wide of the mark.

ON THE ADVANTAGEOUS EMPLOYMENT OF STEREOSCOPIC PHOTOGRAPHS FOR THE REPRESENTATION OF SCENERY.

To the Editor of Photographic Notes.

MR. EDITOR,—The remarks which I take the liberty of offering to you bear upon nothing new in science, and nothing absolutely novel in practice. Yet I think it may be useful to urge them on the attention of persons who occupy themselves with the delightful and instructive science of stereoscopic photography. I have been led to this opinion by remarking that several photographers whom I have met in the field had no idea of the effect of distance between the two cameras, or of the relation which ought to be maintained between that distance on the one hand and the distance of the photographed objects on the other hand. I have seen a person using, for the stereoscopic photograph of a mountain at the distance of several miles, the same apparatus which he would employ for a building or a statue at the distance of ten yards. It is true that, by taking care to have some near object as foreground, a house, a rock, or a pine-tree, he succeeded in producing the impression of *distance* of the mountain, but nothing more: he produced no impression whatever of its *relief*: for all the effect of his stereoscope, the mountain might have been a flat wall duly painted, and its picture to the eye and to the mind would have been as good as that of the noble and deeply-relieved object before him. This is not the proper employ of a mighty principle like that of stereoscopy. If it had been applied as it ought,—that is to say, if the two pictures had been taken from two stations sufficiently separated,—he would have produced on the mind an image representing the projection of every salient point and the recess of every hollow, an image not so much visible as tangible, from which a moulder of ordinary experience could actually mould an accurate model of that face of the mountain which is in view at the two stations.

To illustrate my meaning, and to indicate the difficulties which are to be met, I will refer to two instances.

The first is, the series of pairs of views which accompany Professor C. P. Smyth's book on Teneriffe; a series which form a new epoch in the art of book-illustration, and for which we cannot be too grateful to Professor Smyth, the artist, and Mr. Lovell Reeve, the publisher. It appears (as far as I can judge) that these views were taken with a single camera, removed from one station to another, I know not at what distance, but probably separated several feet. The effect in the vigour of the relief of objects moderately near, and in the separation of distances, is admirable. It will be remarked that these views were taken under a cloudless sky, so that there is no material change of illumination between one view and the other. Still, it will be found that the position of a figure, or the place of a piece of cloth, has sometimes been changed; and the effect is thereby much injured.

The second is, the pair of views of the Full Moon, made by Mr. De la Rue (now sold I believe by Messrs. Smith, Beck, & Beck), the effect of which I must pronounce to be unequalled. To form these, photographs of the Moon were taken in two positions, the distance between which (referring each to a radius of the moon produced) was,—how much does the reader suppose? — nearly 24,000 miles. And by means of these, the moon is presented to us with a convex disc as protuberant and spherical as that of a terrestrial globe or a cricket ball. A new meaning is at once given to every oval spot and every fore-shortened stream of lava. It will be remarked that, when an observation of the moon is secured at the right period, as regards libration and solar illumination, we are certain that we are taking views of an object which is unclouded and invariable.

It appears from this instance that, to exhibit to the mind the true relief of the body viewed, the separation of the two cameras may be one-tenth of the body's average distance, and ought not to be much less. Generally, perhaps, we may say that the separation of the cameras ought to range between one-tenth and one-twentieth of the distance of the object viewed. Thus, if a mountain is five miles distant, the separation of the cameras may be from two to four furlongs.

A moment's consideration will show that we can scarcely hope to succeed, even when the distances are much less than this, by transporting the camera. The change of solar illumination and the changes of shadows of the clouds, independently of the changes of living figures, &c., would deeply injure the effect.

I see no prospect of success except by having two cameras worked in concert, strictly at the same instant (by signal), under the direction of one person. With this arrangement, success would be certain. And the effect would be so *immeasurably* superior to that of all other stereoscopic views that, if it be undertaken by a professional person, I cannot doubt of its commercial success.

It is to be remarked that the value of such views is not limited to the lover of the

picturesque. They possess a real scientific value. The geologist, or surveyor, or mountain-climber, sees at once the relief of the mountains with which he is concerned, even to the dip of strata, the possibility of constructing a new carriage road, or the practicability of making foot-paths. The speculator on glaciers discovers at once peculiarities and relations of form which he could not obtain from any single view.

I may now indicate a few views, partly for their own merit, partly in illustration of my ideas as to the proper separation of cameras.

The north face of Mont Blanc is seen advantageously from the ridge of the Breven. The interval between the camera-stations should not be less than two furlongs. The south face is well seen from the path which leads from the Col du Pain de Sucre to the Col de Seigne; this is nearer, and the interval of cameras may be one furlong. For views within the glacier-hollows, the interval may be perhaps 100-ft. or less, according to the distance of the scenery towards which the face is turned. Those of the Mer de Glace and the Glacier des Boissons are very interesting; the first, as the special subject of Professor J. D. Forbes' illustrations; the second, as being the usual course of ascent to the summit of Mont Blanc.

The most interesting glacier in Switzerland is perhaps that which is most accessible, viz., the lower glacier of Grindlewold. Between the Eismeer, or upper plain of ice, and the bottom, this glacier presents five or six different appearances, all commanded laterally from a good path. The camera-stations ought perhaps to be 50-ft. apart. For illustrating the structure of the Eismeer itself, small separations would also suffice. But upon the Eismeer there are views of most stupendous surrounding scenery, for the due representation of which a separation of 300 or 400-ft. would be barely sufficient.

The moraines on the lower glacier of the Aar (which, in consequence of the surveys by M. Agassiz and others, possess extraordinary interest) would be well commanded from stations near the châlet of M. Agassiz. The stations ought to be at least 100-feet apart. Magnificent views of the north branch of the glacier will be obtained on the surface of the ice; 200-feet of separation would be little enough.

For the north face of the Jungfrau, &c., an interval of several hundred feet would be required on the Wengern Alp.

I will not trouble you with the details of the distances which I would recommend for such views as,—the Hollow of Loch Cornick; the Cliff Range of Loch-na-Gar; the radiating Ridge of Grisedale Pike; the Depth of Borrowdale and the Embranchment of Langstreth; the deep Corries of Snowdon (for which, stations on Moel Shiabod would probably be very favorable); the Twelve Pins and Mwlrhea, above Killery. An artist, who has once fully seized the principle, and has tried it in one or two well-marked cases, will have little difficulty in deciding on an advantageous interval of cameras for any instance that may present itself.

The only apology, Mr. Editor, that I can offer for so long a letter on a subject which (as I have said) possesses no real novelty, is my belief that, by a genuine practical recognition of well-known principles, the science of Stereoscopic Photography may be placed on a footing far higher than it occupies at present.

I am, Mr. Editor,

Your very faithful Servant,

A. B. G.

August 20th, 1858.

FRENCH PHOTOGRAPHIC SOCIETY.

Ordinary Meeting, July 16th, 1858.

M. Regnault, President, put to the vote the nomination of the committee appointed to examine the proofs sent by competitors for the prize founded by M. le Duc de Luynes, for obtaining photographs in carbon. A list of names, which had previously received the sanction of the latter gentlemen, was submitted to the Society, and approved of. It is as follows:—

M.M. Regnault, of the Institute, President of the Society; Balard, of the the Institute, President of the Committee of Administration; Paul Perier, Vice-President of do.; Mailand, Secretary of do.; Le Comte Aguado, Member of do.; Bayard, do.; Edmond Becquerel, Professor of Physics at the Conservatoire des Arts et Métiers; Cousin, Engraver, Member of the Committee of Administration; Léon Foucault, of the Imperial Observatory, and Member of do.; Halot, of the Mint; Le Comte Leon de Laborde, of the Institute, Member of the Committee of Administration; Peligot, of the Institute, Professor at the Conservatoire des Arts et Métiers; Robert, Principal of the Painters at the Imperial Manufactory of Sevres.

The President then announced that all the papers and proofs which had been forwarded to the Society in time, would be submitted to the above Committee.

A letter was then read from M. Maugey, optician, on the subject of the "pupil diaphragm," (see *Notes*, No. 52, page 132). It

claimed for the writer the priority of the above invention in opposition to the claims of Mr. Govi, and M. Charles Chevalier.

[To us it appears that Mr. J. Traill Taylor, of Dumfries, was the first to publish the suggestion of the pupil diaphragm. See *Notes*, No. 24, page 121.]

A letter was read from M. GAUMÉ which stated that the modified process of Dr. Taupenot, in which iodized albumen is spread upon *plain* collodion, is due to the writer, and not to M. Bayard, as had been affirmed by M. Delahaye at the previous meeting. The latter gentleman admitted his mistake.

M. JEANRENAUD presented to the Society a print from an albumenized-collodion negative of the Lake in the Bois de Boulogne.

M. CHARLES NEGRE presented to the Society a large plate engraved by Photography, representing a portal of the Cathedral at Chartres, and measuring 75 × 48 centimetres, (about 30 × 20 inches). This plate is one of the specimens sent for the Luynes Prize.

M. L'ABBÉ LABORDE sent a paper containing the account of a new sensitive substance to be used in Photographic engraving.

[An abstract of this paper will appear in the next number.—ED. P. N.]

M. GIRARD offered the following remarks with respect to some positive prints obtained by Mr. Pouncy, by a new process, and submitted by him for the Luynes prize.

"During the last four months certain English Photographic Journals, but more particularly that edited by Mr. Thomas Sutton, have been occupied with the discussion of a secret process discovered by Mr. Pouncy, of Dorchester, by which prints are obtained in carbon.

"In one of the numbers of Mr. Sutton's Journal, he stated his belief that Mr. Pouncy's prints are really produced in carbon, and by means of a mixture of bi-chromate of potass, gelatine, and lamp black. Great interest has been taken in the process, and a subscription was opened for purchasing it. Almost at the same time, however, we receive the specification of a patent taken out in England by Mr. Charles Cowper, for a process invented by M. Testud de Beauregard; and which renders probable the surmises of Mr. Sutton with respect to Mr. Pouncy's process."

In this Specification we read as follows:

[See Mr. Cowper's Specification in *Notes* No. 54.]

"Mr. Girard added that Mr. Pouncy had written to say that his process differs from the preceding in some important points, and is very superior to it; that he has not yet decided whether to complete his patent at the end of the three months which the English law allows; and has sent two prints to the Society, for the Luynes prize.

"Further, M. Girard stated that it had appeared to him interesting to examine these prints, without waiting for the labours of the Committee, so as to leave no one in doubt on the subject. According to his experiments they are really carbon, and have resisted the prolonged action of concentrated nitric, and hydrochloric acids, aqua regia, cyanide of potassium, cyanide of potassium with iodine, and alkaline sulphides. None of these energetic agents have affected them. It is only when the print has thoroughly imbibed the liquid that the black substance can be removed mechanically from it. M. Girard, in presenting Mr. Pouncy's prints to the Society expressed his regret that they were copies of engravings, from which one could not determine whether the middle tints could be produced by the process."

M. LEMERCIER thought that Mr. Pouncy's process offered a strong anology to that of M. Poitevin, published in the Bulletin in 1856.

[In a note to the above remarks in the Bulletin, an extract is made from *Photographic Notes*, of July 15, of that part of M. Poitevin's patent which relates to printing in pigments, and which has not been published by him in France.—ED.]

M. BALARD said it was difficult to speak of Mr. Pouncy's process, since nothing was known for certain with respect to it; but in any case there was a great difference between incorporating lamp-black with the impressionable material and blackening a print already taken.

[With respect to M. Girard's tests. We can assure that gentleman, and the French Society, from our certain knowledge of Mr. Pouncy's process, as communicated to us by him, and demonstrated by him in our presence, that the black material of his prints is really and truly carbon,—that carbon being of course cemented to the paper by an organic substance, which may be dissolved out by a caustic alkali, (quick lime for instance), while the carbon itself may, we believe, be acted on and oxydized by a hot mixture of nitric acid and turpentine. It might be worth while to try the comparative stability under destructive tests of engravings and Pouncy's prints; the carbon in the former being merely attached to the paper by organic matter and strong pressure, in the latter by a reduced impressionable *in*organic substance in addition to organic matter.—ED. P. N.]

MM. GARNIER and SALMON deposited with the Society, for the Luynes prize, certain processes for obtaining positive prints, both in carbon and sulphide of mercury. A great number of proofs by these processes accompanied their communication.

M. GIRARD read a letter in which M. Gaumé describes a new method of printing and fixing positives. This was submitted for the Luynes prize.

M. DELAHAYE exhibited several prints he had obtained with nitrate of uranium, and described the processes employed.

M. Humbert de Molard described some experiments made by him, with respect to the alleged permanence of uranium prints.

"The uranium process is new, and should therefore be received with favour. We cannot yet say how far it may succeed; but I believe people are wrong in supposing it to be the *ne plus ultra* of Photography.

"The print which I present to the Society was given me by M. Brebisson. It has been pretended that prints by nitrate of uranium resist boiling cyanide of potassium. I submitted one part of this print to cold cyanide of potassium and in five minutes it was destroyed. I submitted the other part to iodized cyanide and it was destroyed instantly. I have tried successively hydrochloric acid, aqua regia, bromine water, chloride of iodine, and hypo-sulphite, and in a-quarter-of-an-hour nothing was left of the image. Ammonia is the only agent which does not affect it, on the contrary it improves it. In fact, I only require five minutes to destroy the image completely.

"I then tried nitrate of uranium in the camera. I worked with a large plate, and a quarter-plate German lens, and with four minutes exposure obtained the bad results which I shew you. At present, at least, the uranium process is of no use for negatives; and as for the vaunted permanence of the prints, it is no such thing. Why do ordinary prints fade? On account of the alterability of the salts of silver. But nitrate of silver is used for developing a uranium print. The silver salt being the element of destructibility it matters not whether it be employed first or last.

"As for the novelty of this process, we may say that it contains nothing that is absolutely new, having a strong analogy to the Chrysotype process of Sir John Herschel, published in 1842, and differing from it only in the nature of the salt, a white piece of paper being in the Chrysotype process impregnated with ammonia-citrate of iron, which gives it a golden tint; then developed with nitrate of silver, or chloride of gold, and fixed with liquor-ammoniæ. My conclusion is that the permanence of the uranium prints is a chimera, and that the process is not new in principle, since that of Herschel leads to the same result. Further, if it is not the *ne plus ultra* of photography, we cannot say but that with time and experience it may not lead to good results. M. de Brebisson has obtained some excellent proofs. The process is so far good that it is an addition to photography.

"I beg of the Society not to lose sight of the ends which M. de Brebisson and I have had in view. M. de Brebisson endeavoured to shew that good prints might be obtained by the process, and he has succeeded. I have endeavoured to shew that the prints are not permanent, and I also have had the misfortune to succeed."

[It appears to us that the prints experimented on by M. Humbert de Molard were developed with *nitrate of silver*. We have left a uranium print developed with *chloride of gold* for five minutes in boiling cyanide without any apparent injury to it. As for the novelty of the uranium process it was published by Mr. Burnett, in all its particulars, at page 100, No. 23 of this Journal, in March 1857, and a uranium print was exhibited by that gentleman at the Exhibition of the Photographic Society of Scotland, in January, 1857. How then, in the face of such evidence, can anyone presume to talk of the novelty of the uranium process, or to attach any credit to M. Niepce de St. Victor for the publication of it in November 1857. The popular objections to the process when gold is used as a developer, are the cold inky tint, and the want of brilliancy, or rather of albumen. When silver is used as a developer, instead of gold, the permanence of the prints is perhaps open to suspicion.—Ed. P. N.]

M. Davanne exhibited some uranium prints by M. de Brebisson, and read a letter from that gentleman describing his process.

M. l'Abbé Moigno thought that the Meeting would be as much struck as he was at the confident assertion of M. Humbert de Molard that the uranium process contained no novelty.

The President observed that Herschel had done nothing in photography properly so called. It was merely as a physicist and chemist that he had observed that certain compounds of bromine and iodine produced such and such results. Such appears to have been also the nature of the researches of M. Niepce de St. Victor. They were undertaken rather in a general than a particular point of view. In photography, as in everything else, we should neither condemn a new method too hastily, nor take it up with too much enthusiasm.

M. l'Abbé Moigno observed that in his opinion an entire Society was wrong in asserting that there was nothing new in a process which had scarcely been tried.

M. Bayard asserted that with ammonio-citrate of iron, and nitrate of silver or chloride of gold, he would engage to do all that had yet been done with nitrate of uranium.

CARBON-PRINTING PROCESS.

BY M. HENRI GARNIER, AND ALPHONSE SALMON, (OF CHARTRES.)

[*From the Bulletin of the French Photographic Society, for August*, 1858.]

The property which ammonia-citrate of iron possesses of being affected by light is no new discovery, but one which either preceded or closely followed that of the analogous property of bi-chromate of potass. It is true that the list of substances modified by light has since been singularly extended. For instance, bi-chromate of ammonia, chromic acid, nitrate of uranium, &c., have been mentioned, and we have added to the list chloride of copper and sulphide of copper,

and we now add the inks of tannate and pyrogallate of iron, oxalate of iron, and alkaline sulphides. The nitrate of uranium is only worthy the attention of experimenters from its special action on the salts of silver, and not from its connexion with a new theory of the storing up of light, a theory which the examination of facts compels us to repudiate as incorrect.

But to return to the metallic salts which are sensitive to light; let us see in what way they are so affected by light as that they may be employed in practice.

The following is the *de primo visu* way in which light acts on these bodies.

1st,—The greater number of them are only affected by light when organic matter is present, such as a textile fabric, gelatine, gum, &c. The citrate of iron is however an exception to this rule, for light acts on it without the help of organic matter,—for instance, when spread upon a metallic or glass plate, a lithographic stone, &c.

2nd,—These sensitive substances are very slowly affected by light when in a state of solution, so that they may be kept in that state without any particular precaution, and it only becomes necessary to screen them from light when they are on the point of becoming dry.

3rd,—When exposed to light the sensitive salt becomes gradually darker in color; this happens to bi-chromate of potass, bi-chromate of ammonia, chromic acid, nitrate of uranium, and tannate, pyro-gallate, citrate, and oxalate of iron. In the latter case the salt is at first darkened by light to a violet color, like the silver salts, but by continuing the action of light the darkened part becomes decolorized.

4th,—At the same time that parts of the salt are darkened by light, they become less soluble in water, and certain liquids have no longer the property of dissolving them. For instance, alcoholized water, and glycerine no longer dissolve citrate of iron.

As for the more profound chemical action which occurs from exposure to light, that is not what we intend to discuss, or take practical account of in this communication.

Preparation of the Paper.

First make a very strong solution of citrate of iron; next, take a sheet of highly-glazed paper; and lastly, a soft dry dabber of linen.

Dip the dabber in a solution of citrate, and pass it over the paper,—at first quickly, then slowly, in order to equalize the coating of the metallic salt.

Dry the paper in the dark.

Exposure to Light.

The cliché to be printed must be *positive*, with the lights and shades true to nature. The time of exposure is from eight to ten minutes in sunshine, fifteen in strong diffused light, thirty minutes in a dull light.

Development of the Image.

When the paper is removed from the light there is a visible image upon it, but feeble and imperfect in the details. The blacks of the cliché preserve the color and original properties of the citrate, and of these unaltered parts use is about to be made.

Take some dry lamp-black and a tuft of cotton wool, and dip the cotton wool into the lamp-black; it is thus charged, so to speak. Instead of lamp-black, black lead may be employed in impalpable powder, or the powder of any metallic salt of zinc, iron, &c.; or any permanent colored powder; and by using black paper, a white powder may be employed.

[The idea of printing upon blackened paper with a white powder, appears to us a very valuable suggestion, and a process of this kind may possibly supersede carbon-printing for certain purposes. —Ed. P. N.]

The picture is then taken into a feeble light, and fastened by its corners to a table, or polished glass plate. The tuft of cotton wool charged with black is then passed lightly over the image. Nothing at first appears, but if during this operation you blow upon the paper the parts of the citrate that have not been affected by light moisten the lamp-black which sticks to them, and the details appear. By continuing this process of dabbing on the black and blowing, fresh details make their appearance, and the image eventually appears in all its parts.

Fixation of the Picture.

It only remains to fix the print. All that is necessary is to immerse it carefully in a dish of clean water, having no dust upon its surface, and thus to remove all the citrate of iron from the paper. It is then dried, mounted and varnished if need be, which terminates the process.

[We suggested a mode of printing in carbon by means of ammonia-citrate of iron and lamp-black, in No. 48 of this Journal, page 82.—Ed. P. N.]

ON THE URANIUM PRINTING PROCESS.

BY M. DE BREBISSON.

In the preparation of positive paper, I generally use a solution of 12 grammes of nitrate of uranium to 100 grammes of distilled or rain water. (About 60 grains to the ounce.)

Although it has been recommended to use thick paper, I use the thin negative papers of Canson and Saxe, because they are more easily washed, and the salts of silver and uranium removed.

I immerse the sheet of paper for five minutes in the uranium bath. Papers completely immersed give more vigorous proofs than those floated on one side only. In pinning up the papers to dry, the pin should be stuck through a corner, kept dry for the purpose.

Paper thus prepared is less sensitive than chloride paper. It requires a strong insolation under a very transparent negative. A negative slightly fogged, and which may give good prints upon chloride paper, which is not suitable for the uranium process, requires a clean *glass* negative. It is very difficult to obtain a good print by diffused light.

The best developing liquid is 3 or 4 grammes of nitrate of silver, to 100 grammes of distilled water, (about 16 grains to the ounce). This bath will serve until it is quite exhausted of silver. I add at first a few drops of acetic acid, but when it has been used for a few proofs, the quantity of nitrate of uranium which becomes mixed with it, renders it very acid. I have developed one half of a print in a bath containing 2 per cent. of nitrate of silver, and the other half in a bath containing 4 per cent. Both halves were equally intense, so that it is unnecessary to use a stronger nitrate bath.

By using an old developing bath, I have frequently obtained prints which do not require toning; but I generally tone the prints with chloride of gold, in much weaker solutions than those indicated in the journals. Thus, in order to make the prints pass from the red colour, which the nitrate of uranium generally gives, it is sufficient to add to 200 grammes of water, contained in a dish, from 20 to 30 grammes of a solution of chloride of gold, strength 1 to 100. (To a pint of water add about 1 grain of chloride of gold). The tone of the print immersed in this weak solution, will not be long in changing, and in two or three minutes will acquire the proper intensity. If the action of the bath is too prolonged a disagreeable blue-black tint is produced.

It has been said, that in order to finish the print, it is now only necessary to wash it in several waters. I can affirm however, that I have very rarely obtained a proof sufficiently fixed in this way to resist exposure to sunshine, which in general reddens it, particularly in the white parts. However feeble the nitrate bath may be, there always remains in the texture of the paper some nitrate of silver which no amount of washing will remove, and which is acted on by light.

I enclose a print which after having been thoroughly washed was exposed for some days to a strong light. All those parts of the paper which were not covered by the passe-partout in which it was exposed have been reddened by the light.

The principal advantage of the new process consisting in the non-employment of hpyo-sulphite of soda, a salt so destructive to positive prints, I have tried various means for avoiding its use. The unreduced nitrate of silver in the paper must be rendered harmless. Ammonia renders the washing easier, but not complete. Salt and water in the first washing converts the free nitrate of silver into loose chloride, which is removed by the water, but some always remains in the pores of the paper; and the print often assumes a marbled appearance, which should be avoided. I have tried other means from which I hoped to obtain good results, but the sun never failed to impress upon the whites of my prints the mark of his power.

What shall I say then? In my distress, weary of war, I sought help from the enemy. After having toned the print to the required tint, I immersed it for two minutes in a bath of fresh hypo, strength 8 per cent. (about 40 grains to the ounce), and I then washed and soaked it in the usual way. I believe that by using a new and weak bath of hpyo, and leaving the paper in it a short time, there are few dangers to be apprehended from the last operation.

The development of the image by chloride of gold alone, or by bi-chloride of mercury, has not given me satisfactory results; and I must say nearly as much of the iron bath proposed by M. Haudoy, of Lille. Whenever I have tried it according to the prescribed formula, I have obtained proofs either completely fogged or nearly invisible. By diminishing the proportions of the iron salt, the prints are still too grey. By adding to 200 grammes of water, about 20 grammes of a saturated and acid solution of proto-sulphate of iron, I have toned the prints to a tolerably good bistre tint.

I have also tried Mr. Draper's mixture of nitrate of uranium and nitrate of silver. The prints after a long exposure to sunshine were incomplete in the details, and of a feeble red tint. I should not deem the matter worthy of mention had I not obtained two very curious effects of colour. In one case a print when immersed in a weak developing bath of chloride of gold, became of an orange colour; in another case a print immersed in a weak iron bath, assumed a fine rose colour.

Now I hardly dare pronounce an opinion as to the permanence of uranium prints, for possibly my chemicals may not have been of irreproachable purity; but, by way of example, I enclose a print upon the dark parts of which I have written the names of four different solutions which I employed as an ink, and the destructive effect of which may be perceived at a glance. The cyanide of potassium and iodine, suggested M. Humbert de Molard, for removing stains from the hands, or linen, has so vigorous an action on uranium prints that the characters traced upon the shadows, with a pen charged with this mixture, are immediately bleached, even before they are dry.

If I may be allowed to express an opinion on this new process, I should say that it offers great advantages from the simplicity of the preparation of the paper, the easy development of the image, and in economy from the weak solutions employed. But the development is sudden, and uncontrollable, which leads to frequent mistakes in the exposure;—and the image produced by light is such that you cannot tell exactly when the action ought to cease; hence arises an uncertainty which makes success a matter of chance.

In the chloride process, the photographer can more nearly approach the artist. He can follow step by step the action of the light, being master of the powerful agent which he directs, and able to

localize its action if need be. The proof showing itself in all its details he can judge with certainty the course to be pursued; and finally, by means of hypo-sulphite of soda, employed with care, and aided by chloride of gold, he may arrive at the most perfect result, either by prolonging the action of the fixing agent, or modifying it, and stopping at the proper point."

"THE PHOTOGRAPHER."

(Manuscript Photographic Journal.) No. II.

NEW SERIES.

MR. J. T. TAYLOR'S PAPER.

"I have the pleasure of introducing among us two gentlemen, one being Mr. Archer, of Manchester, and the other, the gentleman for whom was reserved the honour of striking the first fatal blow at the root of the dark-tent system, by his application of the hygrometric properties of honey to the collodionized plate, and secondly, of opening the door for the introduction of a novel, interesting, and now widely-extended branch of our art — the manufacture of micro-photographs. The first of these tiny little pictures I had seen, were some kindly presented me by the inventor himself, Mr. Shadbolt, and they interested me exceedingly. While in Edinburgh a few days ago, I also saw an excellent collection by Mr. Bryson, Optician, there, who seems to be doing quite a trade in them. While visiting that gentleman's establishment, he showed me a novel and effective modification of the Bunsen gas burner, by means of which views in the lantern could be exhibited with great splendour. It would be desirable were he to publish a short account of it. I have been trying to introduce micro-photographs, but in the meantime have given it up till I get hold of a proper structureless collodion. I have completely succeeded with the converse of this operation, viz., producing *enlarged* pictures of microscopic subjects. How remarkably simple it is! This forms a highly-instructive and pleasant application of the micro-camera. By the way, will Mr. Shadbolt (who is an authority in microscopy) or any one else, kindly suggest a suitable name for such magnified pictures? "Micro-photograph" won't do, because that name has been given to the reduced pictures; the name should be as short and concise as possible, and be as far removed as possible from the *photo-galvanographic* style of nomenclature.

"To those of you who like vignette portraits I will communicate a simple way of producing a first-rate vignette printing-glass.

"Procure a piece of black paper with a dead surface, and from this cut an oval (or any shape you prefer). Paste this oval upon a sheet of white paper, and from the sheet thus prepared take a negative on a piece of nice flat glass — or paper if you prefer it — but observe in taking it that it be *considerably out of focus.* By these means, you will have a vignette plate with the centre quite transparent, gradually merging into perfect opacity.

"I see Mr. Maugey, the celebrated lens maker, has introduced "the expanding and contracting stop between the lenses of the portrait combination," which I published in this journal a year ago. It will prove a great boon to photographers.

"I very much admire the manner in which Mr. Warren reasons on his modification of Dr. Norris's process for preserving collodion plates, and quite homologate his strictures on the relievo-engraving process.

"I enclose a picture, poor enough in itself, but interesting on account of its having been taken during the late eclipse of the sun. The figures represent the President, Vice-President, and Secretary (myself) of the Dumfries Photographic Society. You will see that we have an ordinary telescope fixed in the camera instead of the usual lens. We used the non-reversing eyepiece, and by a little care in adjusting the focus succeeded in getting fair pictures of his Solar Majesty, spots and all; but, alas, when he came to be eclipsed, he *was* eclipsed in reality, for thick murky clouds covered the whole sky. We must just hope for better luck another time."

MR. R. L. JONES'S PAPER.

"Were I in a South Sea island I should be tabooed; were I in India I should be a Pariah, but being in England I feel my position as degraded as if I were both. I, nothing but wax-paper, while all around me rejoice in the Brahminism of collodion. Before I was quite lost in the abyss of paper processes, it is true, one or two friends in the *Notes*, and one or two in the "Photographer" condescended to notice me, to try if there remained one spark of true photographic fire, and to explain how baths might be used acidified and films kept fast to glass, but now all I can expect is, "why does the fellow bother us about waxed paper, when nobody cares a grain of hypo about it?" But this is only when I have the blues.

"I feel myself a hero, a champion, a defender of the needy and defenceless; all others are feeble, faithless, lovers of novelty, fond of the trick of definition to the sacrifice of artistic beauty. They are the tea-board painters (pretty bits for bellows and card-racks are their work), while I am Michael Angelo on the one hand and Turner on the other.

"Come, I think that will do, and having placed myself where I ought to stand, I will begin my lucubration at once, merely adding that if the readers feel afflicted with the above, let them thank their stars that they have not to pay an extra penny for the privilege.

"I have been trying the turpentine process, and my experience is rather that named in the last journal of the Photographic Society, page 230; the lights are not as dense and the process is no shorter. I have taken on the same day and same hour an ordinary waxed paper negative and a Sisson's, and I will send a print from each as an appendix to this, requesting the member whom they may reach, while he has the 'Photographer' in his possession, to add them to the other contributions. I buy the waxed paper, iodized, from Knight, and to be sure of the turpentine I get it from Marion, iodized and albumenized. Albumen is a bad solution, and I have a difficulty in keeping the paper from being marbled. I fancy the definition rather better, but I must be consistent with my exordium and not insist too much on that. I enclose a print from a Knight's waxed paper negative. I never fail in getting something worth keeping, if not first-rate."

MR. G. C. WARREN'S PAPER.

"It is pleasing to see the 'Photographer' turn up once more. I began to think it had lost its way; altho' it has been long in coming it has picked up on its road a good pocketfull of material.

"I feel sure we shall all be proud to number amongst us Mr. Shadbolt, to whom many photographers are indebted. I fancy I remember reading in some account of the Dry Albumen process, now termed Fothergills, that several substances had been used in lieu of albumen; such as dextrine, gum, honey, &c. Now I cannot get a satisfactory negative with the albumen, the development is so very weak that the picture is good for nothing. I tried the honey process both with old and new collodion, washing the honey off the plate and setting aside to dry. The following day I exposed this dry plate and was gratified to find a most excellent negative, giving very fine half-tones and good density in the sky and high lights, the only drawback was that the film of collodion seemed very liable to move in a body off the plate. I must say I have succeeded well with the gelatine solution, as given in my last, and have also worked quickly with it, in comparison with the albumen preservative, but what appears to me rather singular is, that having obtained another sample of collodion (old) I could not get a picture under three times the exposure; the only difference appeared to be, that the first sample was *very old* and had lost its property of forming a strong film, I mean such a film as you could lift from the glass. In my last sample, altho' a twelvemonth old, it had retained this quality, and I suspect this to be the cause of the diminished sensitiveness.

"Mr. Rimmer may perhaps be induced to try the washed honey. The results will be very clean, and any kind of collodion may be used. I should think that if the plates were coated with plain albumen first the film of collodion would stick tight enough, and avoid the bother and trouble of coating the plates in the usual manner. I think a quantity of albumen, after being beaten up to a froth and allowed to settle, might be poured into a bath and the plates carefully dipped one after the other into it and stood up to dry free from dust.

"The carbon print is I think very good for its age, in fact it is quite as good as the early photographic prints from calotype negatives, and I certainly think it worth knowing, and shall gladly forward my shilling to Mr. Sutton for the pamphlet, notwithstanding the criticism in the *London Journal*, which, by the bye, is rather a queer piece of criticism altogether.

"In his statement about photography on wood the critic, as 'one of the public,' says: 'but successful as it may appear it is not equal to some attemtps we have seen," and "we do not know whether Coutencin's method meets this difficulty," (of preventing the solution penetrating the wood) 'but a recent experiment which we had the pleasure of inspecting does so with great success.' I think it rather unfair to make a comparison and speak so highly of a process that has no representative in the exhibition without becoming acquainted with what Coutencin's method really does. I happen to know Mr. Contencin, and also his process, and can state that blocks prepared by him are put in the hands of the wood engravers and give great satisfaction, the solutions do not penetrate the block, and the artist has a white ground to work on in the same manner as an ordinary drawing on wood.

"The samples of collodionized paper are capital; but who enclosed them?* How were they done? Suppose each member when enclosing any pictures puts his initials to them.

"In this town there is an artist who knows little about photography, but has taken out a Patent for 'Improvements in Photography,' a method of copying pictures of any size without the lensular defects, &c., &c., &c., *ad infinitum.*

"I have seen several of his productions, and can only say they are very soft in the half-tones, but the shadows and high lights hard and scanty. After all, he does not give a photographic copy of the picture except in one sense. His method, as most of you are aware, is to *paint a negative* on glass—not use a lens or camera at all!!!—and after that, print his negative on chloride paper; his softness is gained in a similar way, or, I may say, the same way as that by which many persons have obtained a very soft and strange-looking positive, viz., by printing the negative with the plain side of the glass or negative next the sensitive surface of the paper. I think he is on the wrong track, the better way would be to take an enlarged positive as enclosed, then touch it up; from this, take a negative, and then his positive prints.

"Mr Jones must bless his stars that Sisson's Turpentine Waxed Paper process has appeared illustrated with two stereographs. It will bring many disciples, but I think a part of the secret is in cylindering the paper. I should also think that if the negative was cylindered after waxing it would be improved, and sharper impressions obtained.

"The difference produced in positives on paper is quite surprising.

"I have made a few experiments with the nitrate of uranium, but with poor success, the prints appear very weak, especially those developed with gold. Have any of you experimented in this line—if so, what sort of pictures have you obtained?"

* Mr. Sutton.

MR. J. ARCHER'S PAPER.

"The 'Photographer' took me quite by surprise, and unprepared with any subject, as I almost began to think it would never come round.

"However, to make a start, I will confess to a fervent admiration for *wet collodion*, believing it to be, for all important artistic purposes, *the* process. It has, notwithstanding, its drawbacks, and these are by no means *light* ones, (I mean for landscapes). I have for some time been trying to obviate the difficulty by means of a developing camera, but am sorry to say, fruitlessly; the risk in coating and exciting prints, the extreme uncertainty of, and want of command over, the development, liability of the film in all stages to damage, and last, but not least, the nasty disgusting messes that frequently occur, will, I think, always be found impassable barriers to this system becoming general. A print of the camera, set up (a very poor one, the negative being fogged) will be found in the pocket. I am now turning Roger Fenton on a small scale, with *tent*, &c. Can any of the contributors give a suggestion as to the *best*

form of tent to employ for working 9 × 7 plates? With regard to printing, I noticed a remark by Mr. Sutton, in the *Notes*, some little time since, to the effect that prints immersed in an acidulated water bath (hydrochloric acid I think) had, according to his experience, acquired a considerable degree of permanence. A short while ago I tried the experiment of immersing an ammonio-nitrate print, *without washing*, in a bath of hydrochloric acid two or three drops to the ounce; immediately on removing it from the hypo it instantly became *clear*, a little of the half-tone was dissolved, but it left *creamy* whites and shadows of an agreeable light-brownish *purple*. I have not yet applied any destructive test to ascertain its permanence.

"The carbon print is very interesting, and I think full of promise for so *youthful* a process. One good feature observable is the purity of the lights. It is to be hoped that Mr. Sutton's shilling plan will succeed in purchasing the process; the apparent want of half-tone, and depth of shadow would doubtless soon be obviated if photographers could bring their experimentive energy to bear upon the subject.

"Notwithstanding my avowed preferences for wet collodion, Mr. Rimmer's print of Lichfield Cathedral, taken from a honied plate, I must own speaks strongly in favor of a preservative process; the detail in the shadows is beautifully given; would he kindly give his *modus operandi* in an early paper?"

MR. GEO. SHADBOLT'S PAPER.

"In thanking you for your welcome, I must hasten to disclaim one of the honors that you have attributed to me. It is true that I had been long engaged in trying to do away with the dark tent system; but the *first* effective blow is due to Messrs. Spiller and Crookes, who brought out their nitrate of lime process, and in it threw out a suggestion which enabled me almost immediately to strike the second. The hint to which I allude was that of sensitizing the plate first and then adding something to preserve it, whereas I had been striving to do both at one operation; but without any satisfactory result up to the time of the publication of their paper in the May number of the Philosophical Transactions.

"I shall follow the lead of writing a little gossip, principally in reply to what I already find before me in the 'Photographer.' The word 'micro-photograph' originated I believe with myself, and is applied, I think, correctly to very *small photographs*, not to photographs of small *objects*, which would more correctly be 'photo-micrographs'; but probably a convenient word for this class of subjects as well as for *enlarged* copies generally would be 'mega-photograph,' or perhaps we might shorten it to 'megalograph,' or even "megagraph." If my brother contributors will express their opinions upon the claims of these various suggestions, I may possibly be somewhat surprised when next the Journal comes round to me.

"Mr. Taylor is at a stand-still for want of a 'structureless' collodion; this is easily obviated; there are several in the market, amongst which I can at once mention Hardwich's and Thomas's, and several others, but there is really no difficulty in producing it if the pyroxyline be made with the mixed acids at high temperature and the alcohol and ether *nearly* free from water, the former being the most difficult to obtain strong enough for the purpose. I prefer also iodide of cadmium for the iodizing material, though this is merely a matter of convenience as regards keeping properties—not a necessity to success.

"I am sorry to say that I do not share the favorable anticipations of the *carbon* printing process, as expressed by Mr. Jas. Archer, for the reason that I have already given, viz., that all the proofs from genuine photographic negatives, not being mere copies, are almost entirely devoid of half-tone,—the most fatal of all.

"Immediately after Mr. Pouncy exhibited his proofs at the Photographic Society I published in the Journal already cited, the two suggestions following, viz., that they were produced by means of paper coated with the bitumen of Judea, as used by Niepce, the parts unacted upon by light being subsequently dissolved out, or by gelatine, bichromate of potash and coloring matter; as it appears, from *Photographic Notes*, turns out to be a part at least of the truth. Now the difficulty lies here,—viz., that the action of the light, when sufficient, renders the gelatine *insoluble*, but when insufficient it is not *partially insoluble*; but simply soluble *more slowly* than the rest, hence the amount of half-tone (if any) would be dependent principally upon the skill in washing, which would be a very delicate operation to free the lights from every trace of color without destruction of the middle tints.

"It is upon these grounds that I think unfavorably of the process, and though it goes very much against the grain with me to discourage any attempts at so laudable an end as the production of photographs in carbon, it would neither be justice to my brother operators or to the photographic art to encourage that which I really and truly think must end in failure. If Mr. Pouncy had succeeded in producing *satisfactory results*, and chose to demand pecuniary remuneration for making the process public, he would have every right to do so, and I see no reason why the public should object to pay for what they want and cannot get without payment; but if those results are, as I contend, very imperfect, I cannot see the policy of paying for that which is absolutely useless in its present state, and which if it be even possible to improve enough to make useful, eventually may, upon precisely the same grounds, have to be paid for again to the improver. No one would be more pleased than I should were the present mode of printing to become reasonably superseded."

MR. SUTTON'S PAPER.

"When the 'Photographer' comes round next, I will enclose some carbon prints from stereoscopic negatives which I have lately taken in France; but I have been so busy lately with finishing the Photographic Dictionary that I am unable to enclose anything of interest in the present number.

"I mentioned in the last number of *Photographic Notes* that I had lately taken some negatives

upon dry sensitive plates, which I received from Dr. Hill Norris about a year ago. I have now developed half-a-dozen of them, and the results are as good as any photographer could desire. The preservative which Dr. Norris employs is simply gelatine and alcohol, which is inert, and therefore much better than honey. I advise you all to purchase a dozen of Dr. Norris's stereoscopic plates and try them,—for the process appears to me to be a complete solution of the problem of preserved collodion. The addition of honey, as recommended in Mr. Shadbolt's paper, would I think ruin the process. However, next time you shall see some prints from dry plates which have been excited for nearly a year; and you will then be able to judge whether the process requires any modification. When a process works well in its simple form, it should surely be left alone. The tendency to modify and complicate is the great photographic sin of the day. I propose that a fine be levied upon any person who suggests in print a complication of any process, which cannot be *proved* to be better than the original process in its simple form, and that the fine be handed over to the discoverer of the original process for his use and benefit. What say you? Shall we agree to this among ourselves?

"With respect to Mr. Pouncy's process, Mr. Shadbolt's remarks are directed against an *imaginary* process, and not that of Mr. Pouncy. The *facts* are, that Carbon printing *does* give half-tone and good detail. This I hope to be able to prove to you before long by specimens. But a good deal depends on the nature of the surface in Carbon printing, as well as in all other kinds of printing. Examine, for instance, the portraits of the worthy officers of the Dumfries Photographic Society, in the pocket of the present number; although printed upon albumenized paper, how coarse and rough they look by the side of the developed prints, by Mr. Jones, upon plain paper.

"A propos of developed prints. I enclose you a couple printed by me exactly a year ago, one on plain, the other on albumenized paper;—they were printed on the same day, and treated in exactly the same way, for I wished to see which would be the most permanent with only one or two rinsings under the pump for a couple of minutes. The print on plain paper is as good as ever, that on albumenized paper is fearfully faded. Must we then conclude that albumenized prints require more washing than plain prints, and are more liable to fade, either from their retaining the hypo more pertinaciously or from the albumen containing sulphur? I am really inclined to think the use of albumen one of the causes of the fading of prints. Please also to look at the horrible curvature of the marginal lines in one of these prints, from a negative taken with a Ross view-lens of the ordinary construction. With an Orthoscopic lens these lines would have been absolutely straight.

"Now I have a proposition to make to you all. Suppose we were to resolve ourselves into a Committee, and instead of writing random papers were to attempt to settle by our joint experiments some of the vexed questions in photography. Let us suppose, take some one subject, confine ourselves to that, and work it out; then take another. By comparing specimens, holding post mortems upon failures, and working on some definite system, a great deal of good might be done by a circulating specimen-comparing Journal of this sort; for after all what is any man's *ipse dixit* worth *without the guarantee of a specimen?*

"If you think well of this plan, I would propose to you for solution the following problem:

"*How much absolute alcohol S.G. ·794 may be advantageously used in the manufacture of collodion?*

"If we can agree that by adding more alcohol the process may be rendered more sensitive, the greasy streaks in the nitrate bath abolished, the film rendered more nearly structureless, and the developer caused to flow better, then a great improvement will be effected on the present mode of making collodion. For my part I believe the present proportions of ether and alcohol susceptible of considerable modifications for the better.

"Your opinions please on this suggestion. But remember the alcohol must be absolutely anhydrous, and distilled over quicklime or caustic alkali. Alcohol containing water won't do. I believe you will be greatly surprised to find how much *absolute* alcohol may be added to the ether for dissolving any good sample of pyroxyline.

"I should be greatly obliged to Mr. Warren if he would furnish me with the particulars of Mr. Contencin's process.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

THE ORTHOSCOPIC LENS.

To the Editor of Photographic Notes.

Dear Sir,—In the leading article of the last number of the "Liverpool and Manchester Journal" is mentioned several times the "Petzval lens" and the "Orthoscopic lens." For the purpose of preventing the public being mistaken by mixing up the various descriptions of those lenses at present brought into the market, permit me to state, that the lens alluded to in the above-mentioned article,—the same lens which gave "the evidence of the own eyesight,"—*has been, not one of Professor Petzval's*, by the simple reason, because none of this description and size have been issued by Professor Petzval. The first consignment of those smaller lenses I have only received a few days ago, and they possess a focus of 18.-ins. for pictures of $13\times10\frac{1}{2}$-ins.

It is perfectly true Mr. Shadbolt had two of Professor Petzval's lenses for examination, but they are of the larger size, focus 26-ins., size of pictures 16×12 or a circle of 20-ins. diameter. I suppose that Mr. Shadbolt has only examined the portrait-combination with short focus, and perhaps the capabilities of the three lenses together. But I do not think that he has examined at all the large pictures reproduced by the new combination with the larger focus.

I consider it my duty to make this statement, and I am obliged to add that I do this only for the sake of stating the true facts, without the least wish of beginning a new controversy.

PAUL PRETSCH.

67, Great Portland Street, London,
August 21st. 1858.

ON THE WORKING OF NEW COLLODION.

To the Editor of Photographic Notes.

DEAR SIR,—The letter in your August number, from Mr. J. Barbrook, "Upon the working of Collodion," is interesting no doubt to many of your readers who, taking more *interest* in the correspondence, than they do in those clever articles which adorn your *Notes*, are perpetually stumbling on minor points.

Your correspondent has not very clearly expressed himself; I cannot conceive how any one can know too much to take good pictures; instead of requiring some *practical dodge*, they rather want experience, or perhaps industry, to connect and arrange previous efforts and results, for while one is content to take things as they are and at second hand, so long will dodges be looked for, which at best, is but appropriating in an unsatisfactory way the result of anothers industry and talent.

To return to the object of my letter on the working of new collodion, perhaps the following may be of service, it being *practical*; the theory of the matter I do not touch on.

Pictures on new collodion are generally wanting in density, the film at this time being hard, and the layer of iodide thin, the *developer* must be modified to suit it, and herein consists a great matter, more appertaining to a proper developer than many dream of, and I think it will be found, that the harder the film (giving *thin* pictures) the weaker and LESS ACID ought the developer to be. An industrious and thinking photographer, will not expect different qualities of collodion to work equally well, with a given formula of development: by modifying the ingredients any amount of density can always be obtained. I speak of good clean whites and clear blacks.

A chair in front of a *white background* is a good object for experiment, which should be taken over and over again, until a satisfactory result is obtained. If the operators memory is defective, notes must be made for reference, the pictures being saved for examination, a good groundwork will be had, towards obtaining a valuable *practical dodge.*

I have experimented in every way with collodion, and I advise, that the less it is meddled with the better. Should a sample be found unmanageable, a twelvemonth's keeping may bring it into use; the very best I ever used, was some that conquered me. Putting a lump of Iodide of Potassium into it, I placed it aside for eight months, on trying it, it proved very sensitive, and almost too good for use, and it was with regret that I used it up.

The collodion I prefer is Fisher's; with myself it generally works well, I recommend keeping to one collodion, and that when a quantity gives unpropitious results, to consider that the fault lies with the operator and not with the maker; a moments consideration will be sufficient to recal to the mind, that after using a collodion for some time, the *bath*, exposure, and *developer*, have been working in harmony, and that a new collodion will require a different treatment.

Permit me to offer you my cordial thanks, for so ably discussing the theory of matters relating to photography. I cannot read a number of your *Notes* without deriving pleasure and much information.

Your obedient Servant,

RICHARD BAIGENT, JUN.

Winchester, August 24th, 1858.

"*J. W.*" will find a table in which are given the specific gravities corresponding to degrees of Beaumé's Areometer in our Photographic Dictionary. [ED. P. N.]

☞ *The Communications of "Rev. T. F. Ravenshaw;" "Capt. Baxter;" "G. Robbins;" and "Tyro;" will appear in our next.*

Photographic Notes.

SEPTEMBER 15, 1858.

A Correspondent at Manchester has sent us the particulars of a new Landscape and Portrait combination of lenses, for which he is about to take out a patent. This compound lens possesses one great advantage over every other lens that has yet been constructed for photographic purposes, viz., it *entirely* corrects distortion; the image on the ground glass being as perfectly accurate in its perspective as if produced by light admitted through a pin-hole in the front of the camera. With respect to the other qualities of this new combination, we cannot at present offer an opinion, but the inventor asserts that a field of view up to 50° may be included, with a moderate-sized diaphram, and portraits or instantaneous pictures successfully taken with a very large diaphram; so that the same lens may be used either for views or portraits. On these latter points, however, we cannot offer an opinion: first, because we have not yet got one of the lenses to test practically, and secondly, because the theory of the subject involves calculations for spherical aberration and curvature of the image which it might take a month of uninterrupted labour to work out. With respect, however, to distortion, there is not a shadow of doubt but that this evil is *entirely* eliminated and got rid of, and therefore a great step has been made in the construction of view-lenses. In the single view-lens with a stop in front, whether achromatized in the usual way or in the way which has been patented by Mr. Grubb, distortion of the image exists to an extent that is unequalled in any other optical contrivance,—in fact, in this arrangement distortion reaches its maximum, and therefore the sooner this kind of lens is given up the better. In the Orthoscopic lens distortion is nearly but not *entirely* corrected. In the common portrait-lens there is less distortion than in the large view-lens with a stop in front. But in the new combination proposed by our Manchester correspondent distortion is *absolutely* corrected, and the image rendered mathematically perfect, so that in this instrument it is no longer a question whether straight lines in nature are to be curved inwards or outwards in the image,—they are rendered by lines which are absolutely straight, no matter in what part of the picture they occur or what direction they take, or how wide the angular field of view may be. It has been the boast of photographers that their art copies objects correctly, and yet up to the present time every photograph that has been taken is an untrue and distorted representation;—but in future this reproach will be removed from photography, and absolute accuracy in the image obtained. The combination proposed by our correspondent is a very welcome and important improvement.

Mr. Ross is making for us one of these new lenses, and we hope to be able in an early number to report the results of experiments made with it, and to describe its construction.

It has been said that in the construction of a photographic lens, perfection is impossible, and that we have to strike a balance among various errors, viz., distortion, spherical aberration, and curvature of the image;—but distortion is an error which ought to be eliminated at *any* sacrifice from a view-lens, because the other errors can be reduced by the use of a small diaphram. If the photographer will submit to work with a lens having a ½-in. diaphram, the optician is surely bound to furnish him with an instrument which shall give images free from distortion; for that is an evil which no diaphram can remove, while the other imperfections of aberration and curvature may be rendered inappreciable by the use of a small stop. This point cannot be too strongly insisted on, for after all where is the great utility and value of photography, if the image upon the screen is distorted and untrue? It is surely easier to tolerate the want of definition in a picture, if need be, than to endure untruthfulness in perspective, distortion of lines, and exaggeration of proportions. Surely distortion is the *worst* of all optical errors, and the *first* which the optician has to correct.

We have been engaged lately in an interesting series of experiments in the manufacture of collodion, which have led to a curious and important result.

The usual formula for making collodion is

Ether, S.G. 750..........6 fluid drachms.
Alcohol, S.G. 836..........2 " "
Pyroxyline..................2 to 4 grains.
Iodide of Potassium.......3 to 4 "

(*See* Mr. Hardwich's Treatise, page 201).

Hitherto the above formula appears to have been generally adopted, with but little modification. Now, we propose to substitute for it the following:—

PLAIN COLLODION.

Ether, S.G. ·720........... 1 fluid drachm
Alcohol, S.G. ·794.......... 4 " "
Pyroxyline.................. 4 grains.

IODIZING SOLUTION.

Alcohol, S.G. ·825.......... 5 scruples.
Iodide of Potassium.......... To saturation.

By comparing the two formulæ, it will be seen that the latter indicates more than five times as much alcohol as ether,—the former three times as much ether as alcohol. The difference therefore between the two formulæ is very considerable, and for the sake of distinction we propose to call the new collodion "Alcoholic Collodion."

The reader will observe, that in alcoholic collodion, the ether and alcohol of the plain collodion are in the absolute or anhydrous state, while the iodizing solution is the same as that which has been for some time in common use, and is added to the plain collodion in the usual proportion of 1 : 3. The difference is therefore in the plain collodion, and not in the iodizing solution. It will also be observed that alcoholic collodion contains more pyroxyline than the common sort.

We have now to describe the advantages of this kind of collodion.

1st,—Since it contains the minimum quantity of ether and the maximum quantity of alcohol, there is much less difficulty in coating the plate, particularly in hot weather, and several minutes may elapse before the immersion of the coated plate in the nitrate bath. This arises from the slow volatilization of alcohol in comparison with ether. It is not necessary therefore to hurry, or observe any particular precautions in coating the plate; and on removal from the nitrate bath the film exhibits a perfectly even sheet of iodide of silver, free from waves or irregular markings. The operation of coating the plate is so exceedingly easy and certain with this new collodion that anyone may succeed on the first attempt. In short, the chief difficulty in the manipulation of the collodion process in hot weather, or hot climates, is now removed.

2nd,—No greasy streaks appear upon the film when removed from the nitrate bath. Ether repels water, alcohol has an attraction for it, therefore the film containing the maximum of alcohol is most easily wetted and penetrated by the chemicals. Streaks in the direction of the dipper, which are occasioned by the imperfect removal of the ether from the film when in the nitrate bath, when the collodion contains a large proportion of ether, do not occur with alcoholic collodion.

3rd,—The plate does not get dry so quickly between the exciting and developing, because the film is more thoroughly penetrated with water.

4th,—The plate is more sensitive than with common collodion.

5th,—The developer flows much more readily over the plate, and never requires the addition of alcohol.

6th,—The film is not contractile, and adheres so tightly to the glass as to resist any amount of rude and careless washing, even when a portion of the plate only is coated with collodion.

7th,—The film is entirely structureless and as clear as glass. In density, detail, and half-tone, there is nothing to be desired.

Such are the advantages of this new collodion; and we have no doubt it will prove to be the best possible for the tourist. The only wonder is that it has never been thoroughly tried and recommended before.

In making alcoholic collodion the reader will observe that the alcohol must be absolutely anhydrous, and distilled with quicklime, for if the alcohol contains *any* water, the negative will exhibit reticulation in the blacks. The pyroxyline should be made in the usual way. A mixture of one part absolute ether and four parts absolute alcohol will dissolve as much as forty grains to the ounce of good soluble pyroxyline. By adding pyroxyline to the collodion the density of the blacks is increased and the film rendered more "creamy," and adhesive to the glass. When the collodion contains only three grains of pyroxyline to the ounce the film is thin and tender, but by increasing the quantity to seven or eight grains, a magnificent tough and creamy film is produced.

Thinking it likely that some of our readers may be curious to give this new collodion a trial, we have made a few gallons of it which will be supplied as stated in an advertisement; but any one may make it for himself by following the formula stated in this article; there is no secret in the matter, and the *rationale* of the thing is self-evident. To us it appears that this collodion was the one thing wanted to render the collodion process complete, for in hot weather or in hot climates there was considerable difficulty in the manipulation. Mr. Frith relates that when in Egypt and Syria last year, the collodion was sometimes actually boiling when poured upon the plate.

So far as we can judge at present this collodion answers as well for positives as negatives; and we see no reason why it should not become generally adopted for all purposes.

The following is a method proposed by M. l'Abbé Laborde for preparing albumenized paper which will not discolor the nitrate bath :—

"I employ a method which by uniformly coagulating the albumen imprisons and retains the soluble organic substance, so that you may sensitize a great number of albumenized papers without discoloring the nitrate bath. Proceed thus: Fill with water a metallic vessel large enough to float the albumenized papers in, and heat the water to the boiling point; then take an albumenized paper previously dried, and lay it with its back upon the hot water, taking care not to wet the surface of the albumen. In about half-a-minute remove it, hang it up to dry, and replace it by another.

"When a hot iron is used to coagulate the albumen it is not easy to equalize the operation, for if the iron is too hot the albumen is discolored, if not sufficiently hot the albumen is not coagulated, and if of a proper temperature the iron may not be applied uniformly to every part of the paper. A paper properly prepared should withstand the following test without losing any of its lustre, viz., immerse it in water for a quarter-of-an-hour, or sponge it with water; then dry it. If it has been ironed it generally exhibits after this test imperfect coagulation.

"The same process may be used for varnishing prints upon plain paper. When the print is finished and quite dry, it is to be albumenized in the usual way, (not salted, of course), dried, and floated with its back upon boiling water.

"I thought the process might be rendered more expeditious by floating the papers without previously drying the albumen, but the heat produces in the albumen a host of little air bubbles. The albumenized paper should be perfectly dry, and put under pressure before the operation, for it is difficult to float it when it is curled up and out of shape."

M. Laborde also observes that sensitive albumenized papers should not remain suspended too long in the air, but be put away as soon as they are dry, otherwise they are liable to become discolored. He finds that by keeping them between plate glasses they preserve their whiteness for any length of time.

The following is a method of preparing paper with gutta-percha, for purposes of printing, proposed by M. Gaumé, and communicated by him at the last meeting of the French Photographic Society :—

"Dissolve gutta-percha in benzole; let the precipitate settle, and decant the clear liquid. In this state it is very clear but colored; and after evaporating the benzole it forms a finely granulated substance which melts at 212°, and then forms a colorless varnish. Put this into a porcelain dish, immerse the sheets of paper one at a time, and hang them up to dry. When dry they are rather more transparent than before immersion, but exhibit the same glaze as before, only within the pores may be observed an infinity of little white grains of gutta-percha which melt before a hot fire, and combine so as to form an internal varnish or species of sizing, which renders the paper impervious to liquids and comparable to a sheet of glass. It may then be albumenized and printed upon in the ordinary way; the final washings, however, do not require so much trouble as is usually bestowed upon them. The prints are as permanent as those upon glass. Negatives may be taken by M. Blanquart-Evrard's process upon iodized albumen applied to these papers. This method of sizing with gutta-percha is very cheap and simple."

The new substance for photographic engraving, discovered by M. l'Abbé Laborde, and alluded to by him at the last Meeting of the French Photographic Society, is simply boiled linseed oil containing litharge. This mixture, it appears, is sensitive to light, and is said to be more suitable for photographic purposes than bitumen of Judœa. It has long been known that drying oils are oxydized and resinified by exposure to air and light. The first indications of a process consist in diluting the mixture of boiled oil and litharge with ether, spreading it upon a glass plate, and when dry exposing it under a negative. After about five minutes exposure a picture may be developed by the breath, and after a much longer exposure by passing lightly over the plate a dabber charged with lamp-black in powder, which adheres to the parts where light has *not* acted, and slips away from those which have been hardened by light.

Another process consists in applying the mixture of oil, litharge, and ether, to a metal plate,—exposing the plate to sunshine for about half-an-hour,—then washing it with ether, which removes the compound from the parts which have not been rendered insoluble by light,—and lastly, etching the plate with an acid. Of the various substances upon which the oil may be spread that appears to be the best which is the least oxydizable, and they may be stated in the following order of merit, viz., glass, silver, copper, iron, zinc,

The Sulphide of Mercury Printing Process of Messrs. Salmon and Garnier, consists in applying to paper a solution of sulphur, either in chloroform or sulphide of carbon, exposing it under a negative to sunshine for about a minute, and developing the image either with a dabber of cotton charged with lamp-black, or by exposing the print to the vapour of mercury. In the former case the lamp-black, and in the latter case the mercury, adheres to those parts only which have been affected by light. The print is then to be immediately varnished with gum or albumen. The sulphide of mercury forms a dark brown substance in the shadows, which is so far permanent that it resists the action of alcohol, ammonia, and sulphuric, nitric, and hydrochloric acids of ordinary strength; also the action of cyanides, organic acids, and alkaline sulphides; this sulphide of mercury not being the same as that treated of by Messrs. Pelouze and Fremy, and which does not resist all the above-mentioned destructive agents.

A few words now on the Uranium Printing Process:

We have received from a correspondent some uranium prints upon *albumenized* paper, which are so good as to raise the process considerably in our estimation. In detail and vigour they are quite equal to silver prints, but the color of the shadows is perhaps somewhat too red, and lies between a burnt sienna and Vandyke brown; the whites are entirely free from yellowness and as pure as the paper itself. These prints we are assured have not been fixed in hypo, and that is all we are told with respect to them. Should any of our readers be experimenting in this direction we would suggest to them the following mode of proceeding:—

Albumenize a sheet of paper in the usual way, omitting the salt. Hang it up to dry. Float the back of it upon boiling water, as recommended by M. Laborde, for the purpose of coagulating the albumen. Dry it again, and put it by for use when required. When you wish to print float it upon or immerse it in a strong solution of nitrate of uranium, and dry it in the dark. Expose it in the pressure frame for about the same time as an ordinary print, and develop the picture by immersing it in a 20-grain bath of nitrate of silver, which may be used a great number of times. This brings out the picture in all its details, and as it will appear when finished. Then wash it well in cold water, and lastly in boiling water, and immerse it in a very weak bath of bromide of potassium in order to decompose any free nitrate of silver that may remain combined with the lignine of the paper and convert it into insensitive bromide of silver, the yellow tint of which would not be perceived. Then wash again to remove the bromide; and the print is finished. The bromide fixing bath may be used a great number of times, and it would not redden the print so much as ammonia, which after all is not a fixing agent, for the ammoniacal oxide and chloride of silver are sensitive to light.

A professional photographer in Jersey advertises in the present number a simple method of producing a graduated background, which he has described to us, and which we think better than anything that has yet been proposed. In fact, the plan is so simple and efficient that every photographic portrait room should be provided with this piece of apparatus, the description of which, illustrated with a woodcut, may be obtained by enclosing thirty postage stamps to the inventor.

And this leads us to another subject. Time was, in the early days of photography, when new processes and ingenious inventions were freely given to the public, and it was thought sufficient reward to obtain a favorable notice of them in the Photographic Journal; but now photographers seem to have become mercenary, and prefer postage stamps to the honor of contributing to the common stock of knowledge. We would propose the following plan for consideration. Let us suppose that a correspondent communicates to this or any other *Journal* the account of anything new and valuable which he has discovered in photography. The Editor might then, after its insertion, call the attention of his subscribers to the matter, and endeavour amongst them to raise a subscription and present the inventor with either a silver or gold medal, bearing on one side his name, and on the other an inscription to the following effect:—

"Presented by the Editor of and Subscribers to —— Journal, in acknowledgement of a valuable improvement in Photography freely communicated to that Journal, and published in No.— 18 ."

There is an amusing article in the last number of the "Art Journal," (No. XLV., for September), headed "Photography for Portraits," written by Mr. Ronald Campbell. We copy the following analysis of it:—

"The object of this essay is to show that the *body* of Photography is incompetent to maintain its existence in antagonism with the *soul* of Art: that no mechanical process can long supersede the living agency of man's mind: that there could have been no jealous anticipation of the discovery of Photography in Sir Joshua Reynolds's hypothetical allusion to the "*littleness* and *meanness*" of "a

view of nature represented with all the truth of the camera-obscura,"—Photography not having been even dreamt of till more than a half-a-century after his death; besides, that the camera reflects nature in all her rainbow hues, instead of the colorless stains which Photography produces: that as well might the heart-strings of a Paganini's violin be emulated by the revolving cylinders of a patent music box, or the ephemeral wax figures in a barber's window vie with the sculptures of Michael Angelo, as Photography's pretensions, in arbitrating for itself the noble rank of *equality* with the *arts*, be able to maintain it in possession of the usurpation which it now assumes; for it is nothing—and never can be anything—more than "a servant of servants:" and, lastly, that all the extraordinary expertness and parade of literal detail which delight the common people, are just the very objects which the educated painter studies to conceal; "for," says Reynolds, "if the excellence of a painter consisted only in this kind of imitation, painting must lose its rank, and be no longer considered as a liberal art, and sister to poetry, this imitation being merely mechanical, in which the slowest intellect is always sure to succeed best, for the painter of genius cannot stoop to drudgery, in which the understanding has no part: and what pretence has the art to claim kindred with poetry, but its power over the imagination? To this power the painter of genius directs his aim; in this sense he studies nature, and often arrives at his end, even by being unnatural, in the confined sense of the word........To mingle the Dutch with the Italian school is to join contrarieties which cannot subsist together, and which destroy the efficacy of each other. The Italian attends only to the invariable, the great, and general ideas which are fixed and inherent in universal nature; the Dutch, on the contrary, to literal detail, as I may say, of nature modified by accident. The attention to these petty peculiarities is the very cause of this naturalness so much admired in the Dutch pictures, which, if we suppose to be a beauty, is certainly of a lower order, that ought to give place to a beauty of a superior kind, *since one cannot be obtained but by departing from the other*."—R. C.

The writer of the above essay, advocates portrait painting, and disparages photographic portraiture. His line of argument is, that photography can neither idealize, nor tell the truth,—while the artist can do both. Altho' we agree with him in thinking that photographic portraits are sometimes very unsatisfactory, yet we cannot admit the principle that a portrait should be an idealized representation of the sitter. In our opinion, idealization should be strictly confined to works of imagination, while a portrait should represent a person as he actually appears, and not as he might have appeared had his career and occupations been more exalted. The portraitist, be he artist or photographer, has merely to study light and shade, and the circumstances which determine a pleasing expression. It matters not then whether the camera or the paint-brush do the copying work, provided it be done correctly. The sitter is a fact, his history is a fact, and the effects of his career, thoughts, and feelings upon the material features of his countenance, are facts; these facts should be rendered correctly, or the portrait can be at the best but a pleasing falsehood. Artists talk a great deal of nonsense about the ideal. We admire the ideal greatly, in its proper place, but certainly not in portraiture. We have seen photographic portraits in which the finest portraits by Titian, Rembrandt, and Reynolds have been equalled in artistic qualities, and surpassed in truthfulness; and that being the case we disagree entirely with Mr. Ronald Campbell in many of his remarks. But these photographic successes appear to bear about the same ratio to photographic portraits generally as the works of the great masters in art bear to those of inferior artists; and artists of the latter class have to be told plainly that they have nothing to brag of over photographers of the same grade. The majority of the works which cover the walls of exhibitions of paintings certainly leave much to be desired, and exhibit faults which the more extended study of photography among artists might correct.

ON A MODE OF PRODUCING STEREOSCOPIC PAINTINGS, OR PICTORIAL WORKS OF IMAGINATION.

According to a promise given in No. 57, we shall endeavour in the present article to describe a method of producing stereoscopic paintings, or pictorial works of imagination, of any size, to be viewed by means of a pair of reflectors. The process is exceedingly simple, and does not necessarily require any knowledge of the rules of perspective on the part of the draughtsman who makes the outline of the second picture from the original one; although the second picture is in fact a perspective view of the objects as they would appear if taken from a different station to the first.

Take any pair of small mounted pictures intended to be viewed in a lenticular stereoscope. Call the nearest object in the view, no matter in what part of the picture it occurs, A, and the most distant object Z; and call the principal intermediate objects in the picture by the other letters of the alphabet, beginning with B and proceeding towards Z, according to the order in which the objects recede from the spectator.

Now, measure the distance between Z in the right, and Z in the left picture, with a pair of compasses, and prick off upon a strip of card the distance ZZ. Next, measure the distance between the two A's, and prick that off upon the same strip of card, putting one leg of the compasses into the same hole as

before. You will find the distance between the two A's shorter than that between the two Z's. Suppose we call the difference between these two lengths the "differential" of A. Proceed in the same way with the two B's, C's, D's, &c., and call the respective differences between these lengths and the length ZZ the "differentials" of B, C, D, &c. You will then find that the differential of A is greater than that of B,—the differential of B greater than that of C,—and so on.

Before proceeding further, let this result be carefully understood, and fixed in the mind. It may be briefly stated thus. If we take a pair compasses and open the legs until one point is on A in one picture, and the other point on A in the other picture, and then proceed to span the distances between the two B's, the two C's, &c., (no matter in what part of the picture the B's and C's occur), we shall find the legs of the compasses must be opened wider and wider, as we proceed from the nearest object in the view to that which is most distant. And it appears that the reason why stereoscopic effect is produced by looking at a picture taken from the right station, by the right eye, and from the left station, by the left eye, is because the optic axes after passing through two K's, suppose, on being directed through two M's, or H's, are made to pass through the extremities of a line which is either longer or shorter than before; and therefore the point of intersection of the optic axes, (that is the point where the object M or H is supposed to be), is either caused to recede further from, or approach nearer to the spectator than that in which the K's were united; which consequently conveys the idea of relief.

There are two other points which will be discovered by carefully examining mounted stereoscopic pictures. One is that the two A's, the two B's, &c., are always respectively upon the same horizontal line. The other is, that no object which does not appear in *both* pictures can be seen stereoscopically; for any object which only appears in one picture is seen as a transparent phantom in the stereoscope.

Now we come to the application of the principles, and that is so simple, that the leader has probably already anticipated what we are about to say.

A has the greatest differential, B the next, C the next, and so on; and there is a certain law, which connects the differential of an object with its distance from the spectator. But that law is complicated, and need not be rigorously observed in practice. The principal thing to be remembered is, that if an object M be half way between A and Z, its differential must be *more* than half that of A; and this principle must be observed throughout.

Now, let us suppose that an artist has painted a picture, and wishes to paint a second which when viewed in conjunction with the first in a pair of reflectors, shall produce stereoscopic illusion. An easel capable of holding both the original picture and the blank canvas upon which the copy is to be made is provided. The painting and the blank canvas are placed upon it, side by side;—and upon a shelf which supports both, the end of a T square travels, the blade or straight edge of which is always vertical.

The position of the most distant object, Z, on the blank canvas is then decided on, and accurately marked on its horizontal line by means of a pencil mark made upon the T square, when placed opposite to Z in the original painting. The horizontal distance ZZ is then carefully measured, and marked upon a thin wooden straight edge.

The next thing is to determine the position of the point A upon the blank canvas. The artist must consider how much relief he wishes to give to it, and take his differential accordingly. This done the position of A is marked on its true horizontal line by means of the T square and straight edge, as before. With respect to the intermediate objects, the artist must then consider how far they are situated from A, between A and Z, and take their respective differentials accordingly. Having in this way determined the principal points in the outline of the second picture, that outline may be completed, and the color applied exactly as in the first.

If the blank canvas is placed on the right hand side of the painting, the second picture is that which would be seen from a station to the right of the first; and *vice-versa.*

The finished pictures are to be viewed by a pair of reflectors in a way which is too well known and understood to require description in this place. If the paintings are small they may be hung from the opposite sides of a window, or if very large, upon the opposite walls of a gallery, and lighted by a skylight, the reflectors being mounted upon a stand placed midway between them.

We have now described the means of producing a great novelty in Art, viz., that of adding stereoscopic illusion to pictorial works of imagination. But in bringing this matter forward and shewing how easily it may be done, we wish it to be understood that we offer no opinion as to the artistic merits of this application of the principles of Stereo-

scopy in what is called High Art. We are not among those who admire mere mechanical excellencies in art, and if the poetry of a fine painting were likely to be disturbed, or its intellectuality destroyed by imparting an appearance of greater material solidity to the objects represented, we should certainly object strongly to the adoption of the method described in such a case. Nevertheless there will remain to the artist a large class of subjects in which Stereoscopic illusion would certainly be a great gain; and we think it likely that a Stereoscopic Pictorial Journal like the "Illustrated London News," might be very advantageously illustrated on these principles. In fact, there are many important applications of the reflecting stereoscope which remain yet to be worked out, and that instrument has yet to be popularized. We are certain that anyone with talent and capital, and who is conversant with art matters, might carry out the ideas suggested in the present article, with considerable profit. To every class of artists, from the historical or landscape painter, down to the engraver, chromo-lithographer, or mere drawing-master, the application of Stereoscopy in the way we have suggested, offers a novelty which may in a variety of ways be successfully carried out, and which would no doubt greatly please the public.

THE EDITOR.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

WINTER SESSION, 1858.

The Vice-President, W. HOWELL, Esq., in the Chair.

The Members of the above Society held their first Meeting of the present Session at the Odd Fellows Hall, August 31st, 1858.

After the usual business, a paper was read by Mr. H. Branthwaite, F.S.A., upon

THE CHEMISTRY OF PHOTOGRAPHY.

Mr. Chairman, Ladies and Gentlemen.

The past half of the nineteenth century has been prolific with discoveries the most useful, interesting and fascinating. Human minds have given birth to ideas, vast, and for a time so transcendently above the thoughts of the masses, that they have been voted as impossibilities. Intellect has been developed to such an extent that but for the fact of our having grown up amidst the results, they would have appeared but as the imagination of some madman's disordered fancy, and time would fail me to enumerate all the discoveries and improvements which have been made, tending morally and socially to elevate man. The last and greatest of these triumphs has but just issued victorious from its almost overwhelming difficulties and is now thrilling the whole world with wonder and admiration, whilst with the rapidity of lightning the glorious news is flashed across the the broad Atlantic, that, "England and America are united, glory to God in the highest, peace on earth, good will towards men!"

Amongst all these inventions, that which called into existence the Society before which I have to-night the honor of appearing, claims a prominent part, whether as Sparling says, "It be used as an assistant to the artist, or a means of sending home from far off scenes of war and bloodshed, the portrait of a friend, or perhaps the spot on which he died or conquered, for what can equal its truthfulness? what can surpass its beauty? The art has been made subservient to the purposes of the artist, the naturalist, and the mechanic, and even to the antiquary who

Bending o'er some mossy tomb
Where valour sleeps,

may be enabled to preserve a lasting memorial by this science."

So much having already been written upon what is really known of the "Chemistry of Photography," renders the preparing of a paper upon the subject a matter of some difficulty, when we consider that notwithstanding its achievements and rapid progress, we have to confess that it is still encumbered with the long clothes of infancy, and although we are perfectly aware that such and such manipulations and processes will yield such and such results, yet why this is so, or what is the nature of the chemical action, upon the substances employed in the production of the photographic image, is not yet understood and may fairly be classed amongst those mysterious chemical changes constantly going on and for which we are totally at a loss to account. Every photographer has found in his practice, be it amateur or professional, that dissappointments and difficulties are ever besetting his path, and as yet he has no certain course to pursue in order to discover the source of these annoyances and avoid them in the future; our certainties are based upon the results of experiments, tried in order to obtain good pictures, and I must confess myself, as far as I have been able to judge, some of the best photographs I have seen have been produced by mere rule of three practice, by individuals who neither had nor pretended to have any knowledge of chemistry.

It has long been known that chemical changes, both of combination and decomposition, but particularly the latter, could be effected by the action of the sun's rays. This effect at one time was attributed to its luminous rays, but it is now proved beyond doubt that these changes are produced by an imponderable yielding neither light nor heat—to which the term actinism, or chemical power, has been applied. The point at which the greatest amount of chemical action is exerted, is at the verge of the violet part of the prismatic spectrum, as seen in the diagram, A representing the actinic rays arriving at their maximum power, first beyond the violet, decreasing in intensity till it reaches its minimum at the yellow. From thence it is again augmented till it reaches an apparent maximum at

C, the red. The luminous rays it will be seen are wholly confined within the spectrum, commencing only at the point where the actinic have arrived at their maximum, and reaching their greatest intensity at B, the yellow. The calorific or heat-giving rays likewise take their rise at or near the violet, and arrive at their maximum at D, extending far beyond the luminous spectrum. By thus analysing the sunbeam it is found to possess three elements,—which although closely associated with each other, yet have properties diametrically opposite, the actinic or chemical power arriving at its full strength at the weakest points of the luminous A, calorific. It will be well to notice here the reason for admitting yellow light only during the manipulations in Photography. The actinic rays A having ceased to exist, when the luminous, B, have arrived at their maximum.

It has also been proved that more of the actinism is present at certain hours of the day and particular months of the year. During the day we have it most between the hours of 8 and 12. In the year it is found to reach its maximum intensity in the Spring months, becoming less in Summer and Autumn, when the luminous and calorific preponderate. In proof of this, various experiments have been tried by *Hunt* in the course of the germination of seeds. Having found that germination went on more rapidly under blue glass, representing actinism, he was led to have a cucumber frame glazed with blue. The result of this was, that although the seeds germinated fast enough, the plant was diminutive and yielded nothing, having all run to stalk void of chlorophyl (or the green colouring matter to be found on all plants); by this experiment, which although it failed to produce cucumbers, yet it proved to him the fact, that germination depended upon the actinic power of the sun's rays, and convinced him that something more was required for the production of leaf; his next experiment therefore, was to follow the course of the spectrum, and try the effect of yellow glass, by which means he concentrated the luminous rays: his plants grew rapidly and most luxuriantly, but they yielded no fruit. One course only was now open to him, and being determined to work out his experiment, he had recourse to the calorific represented by the red, having a frame constructed of that colour, and found by this that the fructifying principle was so augmented as to produce more and finer fruit than under any other condition. From these experiments he deduced that actinism produced germination, the luminous developed the plant, the calorific the fruit. This analysis of the sunbeam may have appeared somewhat irrelevant to the subject, but I hope to prove by it, that it is to the actinism, and the actinism alone, that we have to look for the chemical changes effected in the production of the photograph. The germination of a seed is purely a chemical change, depending upon the actinic rays, and cannot be effected by either the luminous or calorific. The same may be said of the photograph: its production depends entirely upon actinism, and the same results would not be, if we could shut out the actinic and use merely the luminous and calorific. Almost all other chemical changes may be traced to well-known laws of chemical affinity, but in the germination of a seed and the photographic process, the force which we call actinism interferes as it were with the regular laws of chemistry, causing phenomena which we are able to view without having the knowledge to unfold.

In speaking of the chemical agents used in photography, I must at the outset give it as my firm conviction that most of the failures of the photographer may be traced to the impurity of the chemicals used. In many instances this arises from carelessness of preparation, but in many more I am afraid from the dishonesty of the trader, who in his love of gain sacrifices the interests of his customers, in which of course he is supported by parties who unhesitatingly say sacrifice success to cheapness.

The salts of silver are the most acted upon by the actinic rays. The nitrate is the most permanent of these salts and may be kept either in crystals or dissolved in distilled water, even in the diffused light of the day, not being susceptible to the decomposing influence of the chemical rays till it has come in contact with some organic matter. Its permanence is attributed to the nature of the acid, which, with the oxide of silver, enter into combination, the effect of which is neutralized on its being brought into contact with organic matter. In the Collodion process of course, that organic matter is the collodion which retains the iodide of silver and forms the sensitive surface.

From the important part nitrate of silver holds in our manipulations, being the ground-work of the chemical action of the actinic rays, it must be evident that its purity to the photographer is a matter of vital importance,—the manner of its preparation is so well-known as not to need any description. I should strongly recommend every photographer to submit his nitrate to thorough testing before used; sometimes we find a quantity of free nitric acid, which of course the test-paper will readily detect, and may be easily thrown off, by placing the crystals in a porcelain or glass vessel and holding it over boiling water till the silver is heated to a few degrees. As nitrate of silver is often adulterated with nitrate of potash, from its similarity and ready fusibility, I should next proceed to test for this, which may be done by making a solution of say five grains in half-an-ounce of water; in this, saturate a piece of bibulous paper, and if nitrate of potash be present, even to the extent of 5 grains in 500, it will be readily detected by the paper burning in a similar manner to a fusee, which neither ordinary paper nor that soaked in a pure solution of nitrate will do. A further test may be used as follows: to a solution of chloride of sodium, 6 grains to the ounce, add a solution of nitrate of silver, 17 grains to the ounce; the whole of the chloride in the chloride of sodium will be precipitated if the nitrate be pure, but if, on the addition of more nitrate solution, a further precipitate takes place, it is a clear proof that some adulteration of most likely either copper or nitrate of potash is present, both of which are alike objectionable in Photography. It is sometimes a matter of importance to be able to determine the strength of the nitrate bath after it has been in use for some time, and I regret that Professor Medlock, with whom I have been in correspondence on the subject, was compelled to visit Switzerland before he had

supplied me with his apparatus for easily determining this. It is done by means of a cubic centimetre measure and a standard solution of chloride of sodium of such a strength as that 10 cubic centimetres should precipitate 3 grains of nitrate. This would be an easy way of ascertaining the strength, and as soon as I am in possession of full particulars, I shall have pleasure in communicating them to the Society. The plan I at present adopt is as follows: Dissolve 6 grains of chloride of sodium *Rue* in 34 fluid drachms of distilled water; this I call standard solution, No. 1. I then take one drachm of the bottle to be tested and add to it 1 ounce of distilled water, which we will call solution No. 2. I then add drop by drop of No. 1 to No. 2 as long as a precipitate is given. Every drachm of No. 1 used represents half-a-grain of nitrate of silver in No. 2. Therefore all that is necessary is to multiply by 8 and the product will give the number of half-grains in an ounce.

Before leaving this part of the subject I may just state that I have been informed by a photographer of some fifteen years standing, who gives it me as the result of many experiments, that for every ounce of collodion that passes through the bath, the solution is robbed of five grains of nitrate of silver. Great care should always be taken to keep the nitrate bath from the light, for although pure nitrate of silver solved in distilled water as I before stated is not affected by exposure, yet, after it is brought into use, each plate that is dipped leaves behind it some portion of organic matter, which, in conjunction with the oxygen, causes decomposition. This may be illustrated by exposing to the sun two bottles containing solution of nitrate of silver, into one of which some organic matter has been put.

Iodide of potassium is the next article of importance to the photographer, and one which it is difficult to obtain pure. This arises either from the use of an impure carbonate of potash in its preparation, or of carbonate being added to too great an excess; if the first be the cause we shall have the impurity consist of sulphate of potash or chloride of potassium; if the latter, we have an excess of carbonate; this is easily detected by the addition of lime water, which will cause a precipitate.

In the nitrate of silver and the iodide of potassium we have the two elements forming the iodide coating ready for exposure in the camera, when the actinic rays reduce the silver, which is deposited in minute particles upon the organic matter (collodion). Their capability of doing this is shewn by the following experiment:—Suspend a piece of charcoal in a solution of nitrate of silver of any strength and expose in the sun-light, when the metallic silver will be deposited in beautiful crystals, and this will continue until the whole of the silver is reduced.

The next subject is the developing of the latent image, and no point in photography appears to have been more contested. After reading considerably on the subject, my own opinion is that the developing process is but an extension of the reduction of the salts already commenced during exposure in the camera, in which the actinism has partly disengaged the oxygen which the developing agent completes.

The only two developers I shall notice, are the proto-sulphate of iron, and pyro-gallic acid. The former of these, from its low price, is not likely to be adulterated, but it often happens that owing to carelessness in its manufacture and preservation it contains sesqui-oxide of iron, known by the angles of the crystals becoming yellow or brown; if they are clear, green and translucent, we may safely consider it pure. Pyro-gallic acid is produced by submitting gallic acid to a temperature of 430° Faht. and its use for photographic purposes is in a great measure injured if the temperature has been too high, as it causes the acid when mixed ready for developing, to decompose more rapidly; freedom from color will shew that it has been carefully prepared; its impurity generally consists of tannic acid, which may be readily detected by a solution of isinglass, causing a precipitate.

Having now developed the image, it becomes necessary to remove the iodide of silver which has not been acted upon. This is done by what is erroneously termed fixing agents; for it must be apparent that the image itself *is permanent*, but that part which has not undergone the process of reduction, is still sensitive, and if not well and thoroughly washed away, will in its turn decompose and affect the whole picture. And here we have a great proof of the necessity of free use of water, both after the developing and clearing away of the unaltered iodide; but if the washing be complete, I see no reason why the photograph ought not to remain for ever unchanged either by time or light. The cyanide of potassium is the best clearing agent we can employ, when the iodide of silver is the sensitized surface, as this salt rapidly dissolves in a solution of cyanide; but in cases of positive paper proofs where we have the chlorides of silver, hyposulphite of soda is the best solvent. From the price of these two articles they are not likely to be adulterated, it is therefore unnecessary to enter into any details of tests.

Unforeseen circumstances in business have prevented me giving that time and attention to the getting up of this paper that I should have wished, and that I consider the importance of the subject demands. In conclusion, I can only repeat that the Art of Photography is still in its infancy,—that great and glorious discoveries have yet to be made. Let not therefore dissappointments and difficulties deter us from that amount of perseverance which is necessary to overcome them; if none of these difficulties existed it would be fatal to the swell of triumph which will attend complete success. Let us then

> "Despair of nothing we would attain,
> Unwearied diligence our point will gain."

MR. OSBORN. By way of commencing the discussion, I would just remark that my experience slightly differs from that of Mr. Branthwaite (unless I have misunderstood him), for I have frequently found a bath considerably improved by an exposure to sunshine; it seems to clean it.

MR. BRANTHWAITE. If much organic matter were psesent you would find the silver would be reduced very considerably.

MR. OSBORN. In allusion to the impurities of nitrate of silver, I had a bath which gave me very bad pictures, or I should say no pictures at all: the plates decomposed all over: on testing the nitrate of silver, nitrate of potash was found. A second bath was made and went on very well for a few days, but gradually began to give the same results. Being considerably annoyed and puzzled, I was led to make some enquiries respecting the locality of my operating room (as I was in a strange place), and I found that a quantity of chloride of lime had been thrown down a drain close by, and the vapour of the chlorine had converted the film into chloride of silver. On removing to another room all annoyance ceased.

MR. HARRIS. I cannot conceive it possible for nitrate of silver to be adulterated with nitrate of potash without being at once detected, as the crystals are so widely different. I should have thought the merest tyro would have seen the impurity.

MR. HOWELL. You must recollect that there are a great many photographers who are not at all acquainted with chemistry.

MR. HARRIS. The crystals of nitrate of silver are flat, while those of nitrate of potash are like needles.

MR. HOWELL. Would it not be likely that the needle-like crystals would be broken down into dust and so lose their character, and therefore pass undetected by inexperienced persons.

MR. MORRIS. I have great pleasure in moving a vote of thanks to Mr. Branthwaite for his valuable paper. I would observe that I differ from him on the subject of the impurity of cyanide of potassium: some samples I have seen only contain 2-ozs. of cyanide to the lb. Hypo-sulphite of soda is also often adulterated, but not so much.

MR. BALL. I beg leave to second the vote of thanks, and have felt highly interested by the paper and the experiments, but must endorse Mr. Morris's opinion respecting the cyanide of potassium. I have seen some sold to photographers not worth 2d. per lb. Extreme whiteness is not a test of purity, rather the reverse; in fact, the purest sample I have met with is of a dirty brown color.

The CHAIRMAN. In presenting a vote of thanks to Mr. Branthwaite for his interesting paper, &c., I feel very forcibly that it is one of a class of papers we much want,—eminently practical, scientifically treated, and generally useful. I hope we shall have many such.

MR. OSBORN announced that in all probability MR. SUTTON would give a paper for their next Meeting.

After some conversation respecting the projected Exhibition at Aston Hall, the Meeting adjourned.

⁂ *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

PATENT LAWS.

To the Editor of Photographic Notes.

SIR,—It is a saying that what is everybody's business is nobody's, and in personating the latter individual for the sake of making a few remarks upon the subject above-named, I am inclined to persuade myself that there is a respectable body of opticians who must consider, and justly so, that little or much,—the patent of Mr. Grubb's is an infringement of rights and liberties that we enjoy, as a matter of course, in an equal degree. But the matter requires elucidation (I suppose since the patent is settled and it is hinted is to be upheld), from one acquainted with its practical bearing upon the work of an optician, before a correct estimate can be formed by the public of the deprivation that we lay under during the continuance of this patent.

I can solemnly assure Mr. Grubb that the lens is not new, and that its merits have been variously known to myself for a moderate angle of its picture, and to others, Mr. Slater for instance, to the full angle of its picture; and furthermore, that I never knew before that any optician was bound to publish the curves of his lenses in order to sustain the privilege of making them. This remark applies to the note appended to Mr. Slater's letter. Permit me most respectfully to suggest to Mr. Grubb, how was it that while he pursued the investigations which led to his adoption of this lens that he should think no one else had made it? But we must explain the subject a little. An optician's tools are the "grinding dishes", as our honoured and distinguished continental neighbour, Prof. Petzval, has denominated them: it is by a pair of compasses we describe circles upon paper; so with our optical tools we can make our lenses spherical. Should we not think it rather hard if we were not allowed to describe certain circles on paper. But what is this patent that we are not to grind a piece of crown glass, convex on one side, and flat, or nearly so on the other, and cement to it a concavo-convex flint, and thus achromatize it? This is certainly a vexatious determination? How came it about, that we may not have the free use of our tools, glass, skill, science, and so forth? Why, simply because Mr. Grubb, after he had discovered that it was a useful lens, considers it impossible that anyone else should have made it before,—so what does he do?—he asks Her Majesty's Minister, alias the Patent official, to give him the sole right of making this lens. The minister (or functionary) says,—"I suppose its all right: we don't usually bother our

heads about optical matters, Mr. Grubb; we perceive we are dealing with a gentleman who will rectify it another time if anything is amiss." "Excellent," responds our friend at Dublin, and pays over the fee, (this latter circumstance I regret deeply).

On one hot morning in June, about the 21st of the month, the postman brings the Photographic Journal, and we speedily discover what has occurred. What's to be done? Two important lenses that have been made from time immemorial in our workshops form the subject of a patent when put in juxtaposition and sold as a camera lens. Now meniscus lenses are already largely used for various purposes, condensers and astronomical fields, (see Griffin's Optics, Art. 163), calotype lenses, and various other purposes; and its fellow, the concavo-convex lens is solely used for the back flints of our photographic combinations in the shops of London, Paris and Germany. It is the form assumed by Herschel for the flint lens in the telescopic object glass, whose exact radii have been published to the world,—a work of great skill, without even a patent being thought of. Very well. Here are two lenses that are constantly being made that we are prohibited from converting together into an achromatic compound, and selling. Does it require a councillor to discover some degree of nonsense in this? Nothing more need be said, though I will not lose this opportunity of bearing witness to the interest with which I perused his communication to the London Journal, and he will permit me to sum up by saying that there are reasons existing that the form, number, and dispositions, of lenses should never become the subject of a patent. I trust Mr. Grubb will support that proposition. Honour is of more precious worth than pearls, *nay, gold*, and this I am certain our respected friend Mr. Grubb is about to shew us.

God save the Queen,—crown her senate with honor,—her officers with humanity, at home and abroad,—her people with obedience, equity, and respect for good things. Excuse me for saying so much, but I have done.

JAMES T. GODDARD.

Whitton, near Hounslow,
Sept. 6th, 1858.

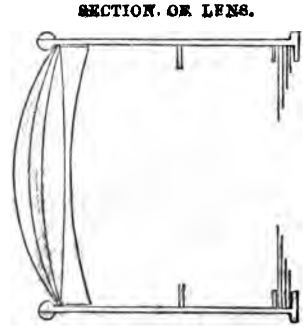
LENSES.

To the Editor of Photographic Notes.

SIR,—I most respectfully beg to have the following inserted in your pages. It is the result of a long and careful investigation of the best formula for lenses for views, and even for portraits, &c. In good light the one already made of 16-in. foci and $2\frac{1}{4}$-in. diameter, will take a portrait in a glass house with shades and North light in less than sixty seconds, and produce very large sized pictures and views 13×11-ins. very free of the usual distortions.

The object of my investigations arose from none of the old or even new formula lenses, giving anything like a fair transcript of the aerial and lineal perspective of the scene taken, and that the blackness and want of detail of trees and foliage, &c., must be met by other means than those afforded by the optics previously adopted for photography. Those qualities, this new lens seems to meet with great fidelity combined with rapid action, as was very amply tested by H. Bath, Esq., and Mr. Thomas Gulliver, photographic artist, and myself, at Swansea, recently, having the celebrated lenses of Petzval and Voigtlander to test with. I beg to say that the first lens constructed from my formula of curves has been most admirably carried out by Mr. J. T. Goddard, of Whitton, near Hounslow, and his price for the above, ready for the camera, is about £3, fully mounted with four diaphragms of $\frac{1}{2}$-in., $\frac{3}{4}$-in., 1-in., and $1\frac{1}{4}$-in. openings fitted in a screw case The above lens is now in the possession of Henry Bath, Esq., of Swansea. This gentleman, together with Mr. Gulliver, I am sure, will afford satisfactory details to any person anxious to know the working qualities of this new lens. I send you two prints (though poor) from negatives taken by the lens in question by collodio-albumen plates, ten minutes exposure, which developed very rapidly, a $\frac{3}{4}$-in. stop being used.

SECTION OF LENS.



4 diaphragms in front of the lens.

No. 1, cemented lens 10-ft. foci. No. 2, meniscus, of plate glass, $17\frac{1}{2}$-in. foci.

Trusting you will do me the honour of inserting the above.

I am, Sir, "A lover of Progress unshackled by Patent Laws," JOHN BROWN.

P.S.—You will see that the angle of view is the same as the old lens, without its errors.

69, Blenheim Street, Newcastle-upon-Tyne.

—The prints sent by Mr. Brown are extremely fine, and we approve highly of the mode of mounting the lens; but more than this we cannot at present say with respect to it. [ED. P. N.]

NIGHT PHOTOGRAPHY.

To the Editor of Photographic Notes.

DEAR SIR,—I have taken the liberty to send for your inspection a portrait taken at night by artificial light by means of the "Photogen." The light was elevated 1-ft. 7-in. above the head of the sitter, the person being placed 4-ft. from the "Photogen," and during the exposure a dark fan was used to shade the eyes and face while the lower parts are fully exposed, thereby equalising the light emitted from the "Photogen." The time of exposure was 15 seconds. My room is 10-ft. long, 8-ft. wide, and 7-ft. high, with white

curtains drawn at top. The camera is placed behind the "Photogen," and the sitter in a direct line with the light.

I have sent these particulars, thinking it might be worthy of some remarks in one of your forthcoming numbers. Yours respectfully,

JOHN MOULE.

Hackney Road, Sept. 1858.

—The portrait sent by Mr. Moule is as fine as anything can possibly be. [ED. P. N.]

"*J. W.*" The potassium iodizing solution is made by dissolving about 14-grs. of iodide of potassium in one ounce of alcohol, S. G. ·825. The salt dissolves with difficulty in the alcohol, and must be previously powdered in a mortar. If absolute alcohol, S. G. 794 can be procured, it is a good plan to dissolve the 14-grs. of iodide in 45 minims of water, and then add absolute alcohol to make up the ounce. Iodide of potassium is freely soluble in less than its own weight of water, but difficultly soluble in alcohol. [ED. P. N.]

"*Photo.*" Mr. Atkinson, of Liverpool, imports Anthony's Collodion. [ED. P. N.]

☞ *The Communications of Capt. Baxter; Mr. Haines; Lewis Hughes; "Enquirer;" D. Taylor; "Amateur;" C. Alger; G. Robins; and John McWatters, Junr.; will be inserted in our next.*

Photographic Notes.

OCTOBER 1, 1858.

We published in the last number of this Journal a new formula for the manufacture of collodion, by which we endeavoured to shew that a collodion, superior in some important particulars to any that has yet been employed by photographers, might be produced. To this new collodion we gave the name of Alcoholic Collodion, from its containing considerably more alcohol and less ether than common collodion. As this matter assumes in our eyes increasing importance, we will bring it once more before the notice of our readers, and point out some good properties of the new collodion which escaped our notice in the last number.

If our readers will refer to any of the old Treatises on the Manufacture of Collodion, or if they will test the specific gravity of the collodion commonly sold by manufacturers, they will find that hitherto it has been the general custom to use less alcohol than ether in the mixture which forms the solvent of the pyroxyline, altho' it has been generally admitted that the addition of alcohol has the tendency to render the collodion more sensitive, and at the same time more easy to manipulate. But it seems to have somehow escaped the notice of experimenters to try the addition of alcohol in its *anhydrous* or *absolute* state, as distilled with quick lime, instead of that which is commonly called "absolute alcohol," but which in reality contains as much as 10 per cent. of water. In short it appears that experiments have been tried with alcohol S.G. ·820, that is with the strongest alcohol which can be produced by simple distillation, instead of with the really anhydrous alcohol S.G. ·794, which can only be produced by distillation with quick lime; so that it has not been generally known that the latter kind of alcohol may be used in a large proportion as compared with the ether in the mixture which forms the solvent of pyroxyline; and we consider it a valuable discovery which we have made, that absolute alcohol may be extensively added to ether in the manufacture of collodion.

It appears from experiments made by us, and which seem to be quite conclusive, that the best collodion for general practical use, is that which is made by adding one part of absolute ether S.G. ·720 to four parts of absolute alcohol S.G. ·794, dissolving in this mixture from six to eight grains to the ounce of good photographic gun cotton,—and iodizing it with the usual iodizer, in the proportion of one part of iodizer to three of plain collodion. This is without doubt a much better formula for collodion than any that has been yet published, and we conceive that collodion thus made possesses advantages which will be certain ere long to bring it into general use. These advantages we will briefly state again under the following heads:

Facility of Manipulation.—When collodion contains the usual large quantity of ether it is not easy to coat a plate properly in hot weather; and it generally happens under *any* circumstances that even when an operator has attained considerable skill in the process he fails in producing an even layer of iodide of silver, when the film is viewed by transmitted light on removal from the nitrate bath. It frequently happens, even in skilful hands, that the collodion which has run to the edge or corner of a plate flows back again, when the plate is tilted, over the part which has become partially dry, so as to produce a cloud or wave. If anyone will examine critically the film on removal from the nitrate bath, he will in general find a wave existing near some edge or corner, which has been produced by the cause stated. But when there is much less ether in the film it does not dry so rapidly, and these irregular markings do not occur, because the collodion flows like oil over the plate, and may be passed backwards and forwards over the same place with impunity. A plate is therefore more easily coated with alcoholic than with common collodion, under any circumstances, but particularly in hot weather; and when coated it exhibits an even film. Again, the less ether the film contains the more easily it is wetted in the nitrate bath, and the more easily the developer flows over it; which are by no means unimportant advantages.

Sensitiveness.—It might be concluded *à priori* that alcoholic collodion would be more sensitive than common collodion, and that we find to be the case; for if the same ingredients are mixed according to the old proportions, and the same bath and developer used, a longer exposure is necessary. This experiment is conclusive on the head of sensitiveness.

Density and half-tone.—Alcoholic collodion contains more pyroxyline than the common sort, and therefore the film has more body. This modifies the effects of solarization from over-exposure, because when a larger quantity of material is acted on by light we may suppose that altho' the surface layer is

solarized, still the part beneath it may be to some extent protected, so that density may be obtained in a thick film when it could not in a thin one; moreover, since the lights may be permitted to receive a longer exposure without injury, the details of the shadows may be better brought out. It has frequently been observed in the paper processes that thick paper gives denser negatives and better half-tones than thin paper,—and this is equally true of thick collodion films.

Alcoholic collodion has therefore the good qualities of being very easily manipulated,—very sensitive,—and giving good density and half-tone;—add to this that the film is so strong and adhesive to the glass as to bear an unusual degree of rough treatment in washing, and that it is perfectly structureless, and gives very clean and pure lights, and the reader will perceive that alcoholic collodion is a good and practically useful vehicle for general purposes, and that it offers great facilities to the tyro in the art, and great advantages over the collodion hitherto employed by photographers.

The good keeping qualities of alcoholic collodion are also worth pointing out. It is well-known that iodized collodion gradually deteriorates by keeping, until in time it becomes red, insensitive and useless. This effect is due chiefly to the ether contained in the collodion, and the more ether there is the more rapidly the change takes place. Now the first peculiarity that struck us in the alcoholic collodion was the paleness of the tint produced on adding the iodizer, and the comparative slowness with which the tint changes to a deeper yellow; for even after several weeks the iodized collodion, (altho' iodized with iodide of potassium), does not pass beyond a straw-yellow color, nor is its original sensitiveness much impaired.

It will be observed by an advertisement on the wrapper that we are about to manufacture this collodion for sale, with the assistance of a gentleman whose acquaintance we have recently made, and who, by profession, has been an Inspector of Distilleries, and who is also a practical photographer. We are building an additional laboratory and cellars for the purpose; and as in the course of time experiments may reveal new facts we shall have no secrets from our readers, but publish everything connected with this subject; at the same time that we shall be glad to learn the nature of the results obtained by others, and to compare notes with them. The dry processes will also form a subject for experiments, and also the collodionized paper process, and the various methods of transferring; and we have no doubt that these practical operations in which we are about to engage will from time to time furnish the materials for interesting articles in this Journal.

The following communication from M. Gabriel de Rumine appears on the first page of the last number of the Bulletin of the French Photographic Society:—

"I have produced direct positives by following the method described by Mr. Sutton in the *Photographic Notes*, published at Jersey. I coat a sheet of paper with a saturated solution of bi-chromate of potass and gelatine, and then cover the surface with a light coating of plumbago. Thus prepared I expose the paper for a quarter-of-an-hour to sunshine, under a negative. I then place the impressed paper in boiling water. The parts acted on by light remain fixed and insoluble, while the parts which have been shaded are easily removed by rubbing with a tuft of cotton wool. The prints thus obtained resemble those which were exhibited by Mr. Pouncy, in London, and printed by a secret process. I think this process susceptible of great improvement, and it is desirable that photographers should direct their experiments towards it, as it would enable us to dispense with the use of the silver salts, and costly substances in printing, and yield prints likely to be as permanent as those in printing ink. I shall pursue my experiments in this direction and make the results known to the Society."

The printing processes with bi-chromate of potass are beginning to attract much attention abroad, and we have no doubt that before long the silver salts will be superseded for printing purposes by less costly and more permanent substances. We are frequently in communication with Mr. Pouncy, and he tells us that he does not intend to publish his process until after the prize offered by the Duc de Luynes has been awarded to the successful competitor. In the meantime he is not idle, but gradually improving his process. The following extract from his last letter will no doubt be read with interest:—

"I received yours of August 31st, yesterday. You say you cannot get depth by the trials you have made. I have printed pictures since I saw you with as much depth as an ordinary engraving." [Then follows an account of a good modification of his process, which if all the world knew instead of ourselves only, we should be better pleased]. "I do not pretend to assert that I can obtain all I wish in a picture at all times, but this I do assert, that I have pictures that contain all half-tone, detail, and depth; therefore if the process will give it in one case, it will in another, the same conditions being present. If we do not obtain it, it is, I honestly believe, through imperfect manipulation, which we cannot expect to understand all at once. I would ask Mr. Shadbolt, are not my carbon prints far better than the first productions of Talbot? Is not CARBON-PRINTING as much a new invention?

Again, we know many persons would not look favourably upon photographs of any kind for years, until their vision had been educated, as it were. Hence arise many obj ections to photography, even now. Apply the same remarks to carbon pictures, and it becomes a matter of taste, and as we cannot account for taste, such objections are not worth notice. When Mr. Shadbolt has failed to produce prints by my process it will be time enough to raise his objections. The clay of which we mortals are composed is far more susceptible in some than in others of receiving false impressions; but there are none so blind as those who *will* not see; a man must be blind indeed not to see through Mr. Shadbolt," &c., &c.

Carbon printing is now beginning to attract considerable attention on the Continent, but of the various processes which we have published in this Journal, from time to time, there is none so simple in the manipulation as Mr. Pouncy's, and we believe his to be the best.

We insert the following extract from the *Athenæum* :—

"A successful attempt has at last been made to obtain what has long been a desideratum in lithography, namely, the means of transferring a chalk drawing from paper to stone, so as to yield any required number of impressions. Mr. Paul Gauci, whose name, and that of his father, have long been honorably known in connexion with drawing on stone, has discovered and holds the secret of this desirable process. From the practical means afforded us of testing the operation, it seems highly satisfactory, but the number of impressions which such transfers will give, in comparison with drawings on stone, has yet to be seen. It has long been known that writings and drawings in ink, executed in plain black lines, made on prepared paper, can be transferred most perfectly on to a stone surface, and be multiplied *ad infinitum*, but all attempts to completely transfer shaded chalk drawings have hitherto failed. By Mr. P. Gauci's process, however, any one can sketch or draw in chalk upon his pleasantly smooth or, if requisite, roughed paper, and have numerous impressions in printing-ink, or, what is more captivating to amateurs, in *black lead*, so printed as really to have the effect of an ordinary lead-pencil drawing. Some studies from Nature, and of trees especially, drawn by Mr. Gauci himself, which have been printed in this process, are absolutely deceptive. For drawing-masters at schools we are of opinion that this new discovery will be of infinite value".

Might it not be possible to transfer a carbon print to stone, and multiply impressions by means of the lithographic press? Or might not a carbon print which would take ink be made directly upon stone by a method better than that of M. Poitevin? Nothing is so much wanted now as the means of multiplying, in printer's ink, and by means of the printing press, really satisfactory untouched photographs.

We copy the following interesting article from one of the Birmingham local papers, (the *Birmingham Journal*). If Mr. Breese would favor us with the particulars of his process we are sure they would greatly interest our readers :—

"Owing probably to the character of Birmingham manufactures, no town possesses a greater number of really good photographers than this. Several important improvements in apparatus and chemical *matériel* have originated here—professionals and amateurs meet periodically for the discussion of principles and practice—and no better exhibition of what English and foreign operators can do has been held in the provinces than that which the Local Society got up at the Hen and Chickens last Autumn. Until the other day, however, we were not aware that we had amongst us an amateur capable of producing pictures quite equal to those wonderful transcripts of sea and sky which have made the name of Le Gray well-known wherever photography is practised. The gentleman to whom we allude is Mr. Charles Breese, of Stanton Place, Icknield Street, West, a Member of the Birmingham Photographic Society. Having accidentally had the opportunity of inspecting some specimens of his skill, we regard their production by a townsman as redounding to our credit as an Art-loving community, and therefore, though unpublished, a legitimate subject for public notice. The pictures we have seen include landscapes, sea views, street scenes, &c., which seem to have been selected in order to show how Mr. Breese can triumph over the difficulties that ordinarily beset photographers. They have been taken by the collodion process on glass, and being double, to serve as stereoscopic slides, the practical photographer will understand how, if only equal to Le Gray's pictures in power and truth, they may yet possess qualities evincing even a higher range of manipulatory skill. This is especially noticeable in regard to those of the series before us which more directly provoke a comparison.

"Perhaps the most remarkable picture executed by Mr. Breese is a view of the sea off Llandudno, close to the Great Orme's Head. A quiet summer breeze is playing over the surface, here rippling the long swell which rolls shoreward, there scarcely disturbing the quiet and sunny bit which shows that a sand-bank is beneath, while farther out the waves are of that short broken-up character usually observed in what sailors call "a chopping sea." Looking at the picture, one might imagine that he was gazing on the sea itself. But for the disenchanting rattle of a four-feeder printing machine a few yards from us, we should be wondering how it was that the hoarse murmur of the waves as they swept up the bay was not making itself heard. Breaker, rolling wave, and ripple, have all been seized, as it were, and "commanded to stand still" until old Sol, artist and portrait-painter in general, had secured their likenesses. Nothing has b[illegible] lost. The glossy surface of the water—the p[illegible] light on the waves as they rise and fall—shi[illegible] and twenty miles off—all have been transfe[illegible]o Mr. Breese's "canvas," so as to make it [illegible]st nature's self. Equally wonderful is a view taken from the pier in Kingstown Harbour. "Landscape, storm clearing off," is a common enough subject in our exhibitions, artists sometimes waiting till the finishing touch is given before deciding by what name the darling of their brush should be christened. No room for doubt in this case. It was worth the

drenching Mr. Breese endured in the cause of science and art, to have secured so glorious a transcript of the beauties of cloudland. Overhead all is blackness, and you can almost see the huge raindrops as they patter amongst the rigging of the ships beneath the town, or break up the smoothness of the wavelets as they course in from the open bay. But away in the distance, over the green hills of Howth, the sun is struggling to break through; the curtain of the hurricane is being lifted, and magnificent contrasts of light and shade are seen. There is nothing lumpy or harsh in the whole view; all the tones are soft, and round, and true to nature. Bank upon bank of clouds, in well-defined but eccentric series, occupy many miles of background down to the edge of the horizon, and within the picture are hill-side pastures, rocky surfaces, villas, the streets of Kingstown, the sea, and a dozen ships. The peculiar texture and form of each object are beautifully rendered. Another view, taken at Kingstown, having her Majesty's ship *Ajax* for the principal object, is also a noble picture. With a bright but nicely chequered sky in the background, every rope and spar stands out clear and distinct; and the sea and town are as effectively caught as in the one just referred to.

"It is obvious that to have successfully depicted rising wave, ever-changing light, and shifting cloud, Mr. Breese must have taken his picture by an instantaneous process. Another of the series, representing Powerscourt Waterfall, in the county of Wicklow, shows this still more strongly. In all the photographs of this kind which we have previously seen, the descending water has usually assumed the appearance of an enormous whitey-blue table-cloth, hung for drying purposes over the face of a very indefinite cliff. This was owing to the length of time which the process usually occupied. The cascade was allowed to photograph itself over and over again. Instead of a dashing stream, breaking on a hundred points, and surrounded by clouds of spray painted in all the hues of the rainbow, it became infinitely less picturesque than would have been a photograph of Kitty of Coleraine's milk pitcher at the moment of the catastrophe celebrated in Irish song. But with Mr. Breese's camera and hood in its neighbourhood, Powerscourt Waterfall assumes a very different aspect. Its leapings and dashings, its gradations of volume, its very spray, are all painted in a way we could scarcely have believed possible; while the tree standing out so grandly in the foreground, with the slaty rocks on either side, are given with such solidity and minuteness as to prove that the subtlety of the instantaneous process used by the operator does not involve a sacrifice of power.

"Having thus cursorily glanced at a few of the long series of landscapes which Mr. Breese has taken, we turn to one or two of local interest. It would have been a pity had we not possessed some worthy record of the most stirring day Birmingham is likely to see during the present century, but the sketches furnished by the illustrated newspapers on the occasion of the Queen's visit to the town were either caricatures or characterless. However, as far as photographers generally were concerned, the 15th of June was so intensely bright, the rays of the sun so scorchingly powerful, that the most expert and careful professionals failed in nearly every case to produce a satisfactory result. Though from thirty to forty gentlemen were stationed with their cameras at various points of the royal progress we had not seen one tolerably good picture until two taken by Mr. Breese were shown us. They represent respectively the arrival and departure of her Majesty from the Town Hall. The views were taken from the offices of the Birmingham Canal Company, at the top of Paradise Street, and of course include all the features of the sea of life which ebbed and flowed so strongly on the eventful day betwixt that point and Christ Church. Pictures more full of animation it is impossible to conceive. The arrival scene shows the crowd literally on the tiptoe of expectation, several groups near the artist being caught in the most picturesque and amusing attitudes. While some are content to clasp the pillar of the great lamp, others, in the forgetfulness of their loyalty, have their arms round the waist of wife or sweetheart, unaware that a gentleman behind was handing them down to immortality in that loving fashion. The dense crowd, the thronged windows, the decorations of private and public buildings, the line of Hussars, the carriage of Her Majesty, the Christ Church platforms, the very hour at which the Queen arrived—all are as distinctly and individually visible as if they had been painted by Horace Vernet, life size, for a national picture, though the plate is not more than an inch-and-a-half in diameter. The "departure" is equally remarkable for its amusing fidelity. The crowd is beginning to separate; bare-headed Councillors are running about in search of their carriages; but rapid as their movements are, they are not quick enough to prevent Mr. Breese's wonder-working camera seizing their lifted leg, and showing it suspended in mid-air. One gentleman is caught in the very interesting operation of applying his handkerchief to his nose. We question if street scenes at all equal to these have ever been produced in England or elsewhere, whether regarded as works of art or of photographic science, and we think it a pity they have not been published.

"We are much mistaken if there is not involved in the process by which these pictures are taken another advance towards that perfection which will no doubt, ere the century closes, find the sun no longer a mere etcher of blacks and greys, but painting a portrait and limning a landscape with the gayest colours which the chemist's laboratory affords. We believe that one or other of the chemicals used by the gentleman of whom we have been speaking is of a more sensitive nature than is commonly used, but probably dexterity of manipulation, and skill in the treatment of the plates, has much to do with the production of these pictures. One fact we happen to know. They are so instantaneously taken that the merest flash of light upon the camera is amply sufficient for the completion of the process. The ordinary movement of the hand not being quick enough, Mr. Breese is contriving an apparatus to ensure the greatest possible celerity."

We alluded in our last number to a new combination of lenses for views or portraits, which has lately been invented by a gentleman at Manchester, and in which distortion of the image is *absolutely* corrected. Our correspondent does not intend to take out a patent for this arrangement, but is in treaty with Mr. Ross to manufacture them for him, for sale. We have submitted the matter to the Astronomer Royal, and his opinion is that the lens does absolutely cure distortion; but with respect to other qualities

he is not prepared to offer an opinion without such an investigation as he has not at present time to undertake. We have not yet received from Mr. Ross the combination which he is making for us on this new principle. Should any of our readers be thinking of purchasing a new lens, we advise them to await the result of our trial of this new combination before doing so, as we shall certainly have something more definite to say about it in the next number.

Since the foregoing remarks were written respecting Mr. Pouncy's process, we have received from him a letter and a print. In this print, all that could be desired is accomplished. The whites are as clean as the paper itself,—the blacks as vigorous as a freshly printed lithograph, or a freshly pitched paling,—and between these extremes every intermediate gradation of tint is faithfully rendered, while the hard outlines of the architecture are cut as sharp as the edge of a razor. This print is a complete success, and in speaking hereafter of Mr. Pouncy's Carbon Printing Process, we must be understood as speaking of one which has now arrived at the same degree of perfection as any other printing process, and which yields results at least equal to any other in an artistic point of view. There is no more feeble black lead instead of vigorous black,—no more want of half-tone or detail. After many months of indefatigable labour, Mr. Pouncy has at length perfected the most important discovery that has been made in Photography. This discovery is not merely applicable to carbon, for the results may be varied in an infinity of different ways by using tinted papers and substituting rich browns and purples for lamp black. The print now before us is printed upon a peculiar kind of very thick paper, and the margin has been protected, so that the print and its mounting are all on one sheet, no cardboard being required. The cost of producing this print was less than that of the cardboard which is ordinarily used in mounting a print. The materials of the process are far less costly than any which are now employed in photography,—the manipulation so simple that anyone may succeed on the first attempt,—and the prints as permanent as engravings. These facts we state with confidence from our certain knowledge of the process as communicated to us by Mr. Pouncy himself.

In the letter we have just received Mr. Pouncy once more asks our advice as to what is to be done with this important process, and the tone of his letter leads us to the belief that, could a suitable sum be raised *at once* by photographers, he would make the process public. If, then, within the course of a week £100 could be collected from our subscribers, we have no doubt of being able to publish the process in the next number of this Journal; and that would be a plan we should much like to see accomplished. On the other hand we have been invited by Mr. Pouncy to co-operate with him in carrying the process out commercially in some way or other, and if the appeal we now make is not responded to, we shall probably join him in operations of some kind; which would not however affect the publication of this Journal, as at present, or interfere with the other operations in which we are engaged.

But the matter shall be for a few days entirely in the hands of our readers. If £100 could be at once offered to Mr. Pouncy he might accept it and publish his process; but from what we know of him we feel sure the chance will not occur again. Let photographers then combine at once, and treat this matter in the way in which it ought to be treated. Let everyone to whom this appeal is made subscribe at once to the best of his ability. All that is required is to send us a letter stating what sum the writer is prepared to give when called on for his subscription, and we will publish the list of subscribers in the next number of this Journal; and we hope along with it the particulars of Mr. Pouncy's process.

Here then is the second and it will be the LAST attempt we shall make to give Mr. Pouncy's process to the world. Should it fail, it will be simply a national disgrace, and Continental and American photographers will have just reason to be amazed at the apathy shewn by Englishmen in this matter.

SUGGESTIONS FOR IMPROVEMENTS IN THE CAMERA, AND MOUNTINGS OF LENSES.

By Thomas Sutton.

[*Written for the September Meeting of the Birmingham Photographic Society.*]

Mr. Chairman and Gentlemen.

When I received, for insertion in the Journal of your Society, the report of your last Meeting, it was accompanied by a letter from your Secr[illegible] inviting me to contribute a paper for your [illegible] Meeting. I can assure you I felt much fl[illegible] by the request, and it has been an agreeable [illegible] to me to comply with it.

Mr. Osborne proposed that I should take for my subject "The Photographic Camera, and Mounting of Lenses," and lay before you certain suggestions which have occurred to me for the improvement of the instrument by means of which photographic pictures are taken. The subject is important, and I feel the more pleasure in submit-

ting my remarks to your notice, because I am sure that an audience in such a town as Birmingham must be likely to contain many ingenious practical men who will perceive at a glance the merits of any real improvement in apparatus which may be pointed out.

But first let me observe that my object in proposing certain modifications in the present form of the photographic camera and mode of mounting photographic lenses, is, that we may improve our means of obtaining a good picture, and not that the instrument may be rendered more portable, or more convenient, or prettier to look at, or cheaper to buy. I feel sure that I am expressing the opinions of every one present, when I say that since photographic pictures have now reached a high point of excellence in the hands of skilful operators, no one should rest satisfied with only tolerable results obtained with comparatively little trouble or cost, if it can be shewn that by any improvement in his apparatus, and by bestowing a little more trouble and thought upon the matter, better results can be obtained. I mean that we must now look more to the end, and less to the mere *convenience* or *economy* of the means employed; and if with a rather less portable, and perhaps more costly instrument, better pictures can be got, then we must rather congratulate ourselves that a little extra trouble and money can be well laid out, than grumble because the camera and lens are a little heavier and cost a trifle more than they did before. In fact, I feel sure that there is not one among you, who does not agree with me that it would be better, if need be, to carry the apparatus to the field in a waggon, drawn by a team of horses, and return with good negatives, than to walk there comfortably with the whole of the apparatus in one's coat pocket, and return with indifferent pictures; for surely labour is a pleasure when it ends in success,—amusement a toil when it ends in profitless results.

In a word then, I will endeavour to direct your attention to some defects which I observe in the ordinary construction of cameras and lenses, and will suggest how I think they may be remedied, without caring to consider whether the apparatus is thereby rendered heavier, or more costly, or unsightly,—or whether the bulk of amateurs or professionals are likely to trouble their heads about these improvements,—or the trade likely to modify the instruments which are now made and sold by the gross. My remarks are addressed to the thinking, pains-taking photographer, who will be glad, I am sure, to have any method pointed out to him, by which his own apparatus may be improved.

To the point, then :—

I will assume, for the sake of argument, that the glasses of the lens do their work properly, and produce a good image upon the focusing screen, and that the camera is light-tight, and well put together. The question then becomes,—is all extraneous light which enters through the lens completely prevented from falling upon the image? I regret to say that in general it is not; and my object in this paper will be to endeavour to show why, and where, stray light finds its way into the camera, and falls upon the picture.

Suppose, gentlemen, you were any of you to enter an artist's studio, and observe him at work before his easel, and you saw that while he was painting one part of his picture in pure clean colors, a monkey seated upon his shoulder was amusing himself, unknown to the artist, with applying a long brush filled either with black or white paint, to some other part of the picture—would you not be inclined to knock that mischievous monkey off his perch, and remonstrate with the artist for permitting such an animal to enter his studio? Now, the unfortunate photographer is very much in the position of the artist in the above case, only instead of the monkey, he has to deal with a thousand stray beams of light which the optician has allowed to enter the camera, and which paint a second picture of their own upon the legitimate image. Let us then do battle at once with these straggling rays,—trace them back through their tortuous paths to the point of ingress, and banish them from the image, so as to get pictures free from accidental blurs and fogs.

The way to deal experimentally with this subject, is to take the camera out of doors, and expose it to a view that is strongly lighted,—then, (the end of the camera being open, and without the ground glass), to throw the black cloth over your head, and draw it tightly under your chin and the bottom of the camera, and observe what light you see within, bearing in mind that whatever light from any part enters your eye, would also fall upon the sensitive tablet in the same place.

I will first discuss the case of the view-camera and lens with a stop in front.

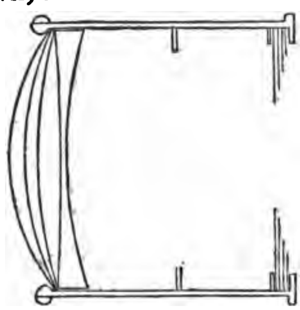
The first thing you will observe in this or any other camera is, that the picture formed by the lens is round and larger than the oblong end of the camera, so that on all four sides of the camera, next to the open end, a luminous image is thrown, in the shape of the segment of a circle; consequently the reflected light from these four segments, which enters your eye and renders them visible, from *all possible positions*, must fall upon *every* part of the sensitive tablet. Here then we have discovered one source of diffused light, which falls upon the entire picture, and produces universal fog, to an extent depending upon the reflecting power of the sides of the camera. These outer segments of the image formed by the lens, and which fall upon the sides of the camera, may be easily cut off by a diaphram, having an aperture, the size and shape of which is determined by supposing a straight line to travel round the circumference of the back lens, and the edge of the picture, and at the same time always to pass through the axis of the lens. In all my cameras the first thing I do is to insert a diaphram, made of millboard, at about one-fourth of the distance from the picture to the lens. I make the diaphram like a shallow cardboard box, and push it into the camera to the required distance. Should the lens be raised or lowered by the sliding adjustment in the front of the camera, a different diaphram must of course be substituted for the first. This involves a little trouble. I leave it to your ingenuity to suggest some simple plan for effecting these changes, without which I think you will agree with me, that no camera is complete. It would answer the purpose nearly as

well, to put a diaphram having an aperture the same shape as the picture against the back of the lens, but the objection to that plan is, that such a diaphram would cut off the outer half of all the extreme oblique pencils. In some cases it might be necessary to add a second diaphram between the first and the lens. In fact it may be stated as a general principle to be observed in the construction of all optical instruments, that a series of diaphrams, having suitable apertures, should be inserted between the lens and the image in order to cut off reflected light from the side of the tube. On looking through such a tube towards the lens, nothing would then be seen but the lens, because the dark sides of the diaphrams would be turned towards the eye, and these could reflect no light. I do not know whether this principle is generally observed in the tubes of telescopes used at Observatories, but I have a fine astronomical telescope 4½-ins. aperture, and 76-ins. focus, in which the principle has been overlooked, and the consequence is a want of purity in the image, which is sadly diluted with diffused light.

The insides of cameras are usually blackened with lamp-black and glue, which is a very good composition for the purpose. I think black velvet unnecessary when proper diaphrams are inserted. I believe nothing more is wanting in the inside of the camera.

The next stray light you will perceive is a ring of light round the lower part of the circumference of the lens. This is seen most clearly from the middle and upper part of the camera. To convince yourself of its bad effect, put the ground glass in its place, and you will find that the shadows in that part of the picture are diluted with diffused light; but the effect disappears if, while you are looking in, some one shades the upper part of the lens with his hand, so as to cut off oblique light from the sky; but this shading of the lens must be carried down to such an extent as to cut off also a part of the picture. The proper remedy is simple enough. The lens should be made half-an-inch larger in diameter, and an annulus a quarter-inch wide, should cover the outer part of its face; because this luminous ring is occasioned by light, which is internally reflected from the broad outside edge of the lens.

Next, remove the lens from the tube, and make your observation again for stray light. In some view lenses the tube is shaped like a cone, having the stop at the small end and the lens at the large end. In this case the inner sides of the cone are lighted by oblique rays, and consequently reflect light, which is scattered in all directions by refraction through the lens. This conical mounting of a view-lens is as ill-conceived as anything can well be. But suppose the lens to be mounted in a cylindrical tube, having a small stop midway between the open end and the lens;—observe what happens. The lower part of the tube, outside the stop, is lighted by the sky; some of this light is reflected through the stop and lights the upper part of the tube inside, and a confused image of this patch of light is formed by the lens towards the bottom of the picture. The prolongation of the tube beyond the stop is therefore of no use. Instead of this, a diaphram, having a round hole of suitable diameter, should be placed midway between the fixed stop and the lens. When this is done no light will be seen on the inside of the tube, and the mounting of the lens is perfect;—(see the following figure, in which, however, the annulus round the face of the lens is omitted, through a mistake of the engraver):—



We have, so far then, a properly-constructed view-camera with a properly-mounted view-lens of the ordinary form; but I have not yet done with this instrument. You all know that by going down to the bottom of a well the stars may be seen at mid-day. That is because the diffused light existing in the atmosphere is cut off and only the light emitted directly from the star allowed to enter the eye. Now this principle should be observed in the construction of cameras, and only the light which is emitted by the objects of the picture be allowed to fall upon the lens. To effect this, a long tube is by no means necessary; all that is required is to continue the camera in front of the lens to about two-thirds its focal length, and to close the open end of the camera in front by a diaphram having a hole the same shape as the picture, and of the proper size. This renders the instrument complete, and no light, save that from the objects to be taken, can by possibility fall upon the picture. Some time ago you will perhaps remember that a little discussion was conducted in this Journal between myself and some other gentlemen with respect to the shape of the diaphram as determining the shape of the picture. What I said then is not contradicted by what I say now. The diaphram in the lens tube may be any shape you choose,—round, square, or triangular,—and the picture will still be round; but a diaphram in the front of the camera produced *will* determine the shape of the picture, for it will form, so to speak, a part of the picture. I hope this is now clearly understood.

The modification which I have made in my own cameras, and which I have now described, may therefore be summed up as follows:—

My camera is a box, nearly twice as long as the focal length of the lens. Nearly in the middle of this box a partition is inserted which carries the lens upon a slider having two motions in the usual way, and which when necessary passes through the sides of the camera. One side of the camera has a trap door through which the hand may be inserted for focusing the lens. Both ends of the camera are open. In one the dark slide is placed; in the other a diaphram the same shape as the picture. Between the lens and the dark slide, and rather nearer to the latter, a diaphram is inserted. With

such a camera, and a lens mounted as I have described, no stray light can by any possibility fall upon the image.

There are one or two other points connected with the camera, on which I shall be glad to have your opinion. I think it a very desirable thing to be able to do away with the ground glass, and to focus upon the sensitive film itself; partly because the ground glass is an extra article to carry, and one very liable to get broken; but principally because a better focus would in general be obtained by focusing directly upon the film. I find it perfectly easy to focus upon the film, when a piece of yellow glass is put before the lens,—the head and arms being of course inserted in a black bag attached to the back of the camera. Let us then see if we can get rid of this black bag operation, and still focus upon the film.

My idea is that the dark slide should have two sliding shutters, one in front as usual, the other at the back; and that instead of putting the head and shoulders in a black bag, a Ramsden's eye-piece should be used as a focusing magnifier, which might be passed about upon the back of the plate, and be connected with black stuff to the end of the camera. The lenses of this magnifier, (which are simply two equal plano-convex lenses with the plane sides outwards) should of course be made of yellow glass. One great advantage of focusing upon the film would be in taking instantaneous picturés; the proper moment for uncovering the lens might then be determined to a nicety and the yellow cap be removed by the mere pressure of the finger upon a trigger; and while on this subject I should be glad if you can tell me of the best contrivance for an instantaneous cap.

There is however another plan for focusing upon the film itself which might be better than a Ramsden's eye-piece, with yellow lenses, and a black bag. Every dark slide, you all know, should be made capable of taking non-reversed pictures if required, by putting the plate with its plain side next to the lens. Suppose then we make the slide so that the plate is put in from the front, and that either side of it may rest upon silver wires, while some simple contrivance at each corner fixes it in its place. The back of the slide may then be made of yellow glass, covered with a black curtain, and the focusing may be done upon the film, with the head under a black cloth in the usual way. These are matters which I think worthy of your consideration, and I shall be glad to have your suggestions with respect to them.

I would now discuss the mode of mounting the Orthoscopic and Portrait combinations, did your time permit; but I believe that enough has been said to indicate the principle which should be observed in the mounting of photographic lenses. The bad effects of not attending to these principles are immediately perceived when a portrait lens and camera of the usual construction are taken out of doors, or when a common view lens is turned a little towards the origin of light, or towards the sky, for the purpose of taking clouds. As for the portrait-lens, the mounting of that instrument might properly form the subject of a separate paper.

With respect to the mounting of the Orthoscopic Lens, I cannot suggest any improvement. The diaphram which has been judiciously inserted between the back and front lenses appears to be all that is required.

I shall be glad to have your opinion on a point connected with the portrait-lens when used with a small diaphram for taking views. According to my experience, it happens with all portrait-lenses, when the diaphram is placed between the lenses, (or in contact with the front lens, it matters not), that a round patch of fog occurs in the middle of the picture, when the lens is presented to an ordinary well-lighted view. I cannot quite explain this satisfactorily to myself. It does not proceed from dew upon the lens, nor from diffused light which enters in any way, because I have taken every possible precaution to prevent this. My impression was, until yesterday, that this patch of fog did not occur when the stop is put midway between the lenses, but I find I was wrong in that idea. Only yesterday, I went out for the first time to take some views with my large portrait-lens, which is 4-ins. diameter, and 13-ins. focal length, and midway between the lenses of which I inserted a stop three-eighths-of-an-inch diameter. I took three negatives, in the centre of everyone of which a dark spot the size of a half-crown was produced. Before sitting down to write this paper this morning, I busied myself for a couple of hours with the attempt to unravel this mystery, but I am sorry to say in vain, for I can only guess at the cause of that spot. It appears however that the larger the diaphram the larger and more diffused the spot becomes, so that with full aperture out of doors the entire plate is covered with a veil of fog, which is thickest in the middle; and when the lens is used for instantaneous pictures, this fog destroys the brilliancy of the shadows in the centre of the picture, a defect which I have perceived in all the instantaneous pictures by other artists that I have seen, and which have been taken with portrait lenses. I am inclined to think that this spot is occasioned by light which has been internally reflected at the inner side of the convex surface of the front lens, and which forms a sort of cone of light, having the front lens for its base and its apex a little way nearer to the back lens than the stop. This apex then forms the origin, so to speak, of a diverging pencil very near the back lens, which pencil, after refraction through it, forms a confused circle of aberration upon the picture, which occasions the unfortunate spot in question. I have never thought the portrait combination at all adapted for taking views, even with a small stop, and now that this spot seems to be a frequent accompaniment of the use of that instrument out-of-doors, I shall in future feel doubly distrustful of it. The Orthoscopic lens, although a double combination, works extremely clean, but that may be because the back lens is actually placed at the stop, so that any supposed cone of internally reflected light from the front lens would not have the opportunity of coming to an apex or point, but would be scattered in all directions. I wish it to be understood however that the spot produced by a portrait-lens with a small diaphram between the lenses only occurs to an injurious extent when one part of the

view, (the sky for instance), is strongly lighted, and the exposure timed with reference to the deep shadows. Besides, I sometimes develop my negatives with iron, and that may fetch out the spot more disagreeably.

And now, I think, Gentlemen, I have pretty nearly exhausted your patience, and the time allotted to the reading of a paper. I fear my subject has not been very entertaining, and that I have not treated it in a very amusing way. It is however important that all obvious optical defects should as far as possible be removed from the instrument in which photographers take their pictures, and I trust that my introduction of the subject will elicit some able comments and suggestions from yourselves.

Permit me, in conclusion, to assure you of the pleasure it always gives me to receive for insertion in my *Photographic Notes* the valuable communications read at your Meetings, and of the satisfaction with which I observe the growing importance and increasing usefulness of your Society. If I can, in any way, as a Journalist, promote your interests, I beg you will never hesitate to make use of me. I am sure you will be glad to hear that the Journal of your Society has nearly doubled its circulation during the present year,—that it is gradually gaining a footing in America, through the kind exertions of Messrs. Anthony, of New York,—and that in India, Australia, China, and the Cape it has numerous subscribers, principally among military gentlemen, many of whom have now adopted photography as a hobby; while on the Continent most of the eminent photographers with whose names you are well acquainted appear to be familiar with its contents. In fact, the *Notes* are now rejoicing in a state of financial prosperity which far surpasses the expectations I originally formed of such a periodical. I have been frequently asked why I do not carry out an idea I once entertained of publishing weekly,—but I have thought it better to leave well alone, having my doubts how far a weekly Journal of Photography is really required or could be satisfactorily sustained, and feeling quite sure that a weekly Journal would take me too much from my dark room, and interfere with the experiments which can alone sustain my original articles, and keep me up to the mark in my replies to correspondents. I confess it is my ambition to be something more than a mere newsmonger or writer,—and that being the case, my dark room, and the days I spend in it, are as necessary to my Journal as the type and printing press.

You know I have published lately a Dictionary of Photography. I have enclosed a copy along with this communication, which I trust you will honour me by adding to the library of your Society.

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEARS 1856-7.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Continued from No.* 53.]

Judging from the multitude of artists that one meets wherever one wanders in the Lake District of Cumberland and Westmoreland, I should think that more umbrellas, palettes, portable easels, and all the usual artist's paraphernalia, are consumed there, than in any similar given area that is to be met with in any other part of our Island; but notwithstanding all this evident attraction, I am not quite sure that it is pre-eminently the country for the *Photographer*. I was able, quietly and leisurely, to wander through all this favored district, and with camera in hand, and therefore I speak not unadvisedly. That the Tourist meets with many a striking and eligible bit of scenery in each day's perambulation, and well calculated for the photographer, I will not deny, but I think 'tis better fitted for the brush and the painter; the distances are too great, the pictures too large, and the aerial perspective, which gives such a charm to the Lake scenery, unattainable in photography, at least to that extent which will do justice to the unrivalled scenes that have met one's eye. I will quote as examples the Waterhead end of Windermere, with all that glorious grouping of distant mountains, bright, sunny, and with ever-varying aerial effects, unattainable but with the aid of color, for to color is the principal charm and beauty owing. The same may be said of the Borrowdale end of Derwentwater. I several times tried this in the camera and gave it up as hopeless; still, many isolated spots are eminently beautiful as photographs. Furness Abbey alone is worth many and many a miles journey, and will amply repay any one for the pilgrimage. I spent three days here, and worked hard too, for the beautiful parts of this most picturesque ruin are endless. I would specially signalize the east window, a good view of which is attainable from the rising ground opposite to the Druid's temple, near Keswick, from its perfectness and antiquity, and the panorama of, Hill's Island makes an admirable picture. Buonness Ferry Side, Uray Castle, Coniston, the Baider Stone, and Honister Crag, all make good subjects. The Falls, concerning which so much is said, did not at all equal what has been written concerning them; a scarcity of water too—a sad want—which is often to be met with in the summer months. Several times I have seen Lodin fall, with scarce anything more than a thread of water leaving the wide chasm, with the marks only of where, in the winter months, the rush of water has worn its way into the crumbling rock. To those who possess the means of taking instantaneous pictures, many of these, as for example Scale Force, Lodore Fall, Rydal Fall, &c., may prove acceptable; but as they are generally produced with the water looking like a solid, still, and heavy mass, and losing all its lovely and ever-varying effects from movement, which, except it be caught instantaneously, it is utterly impossible photographically to display. The small stereoscopic pictures perhaps convey the best idea of these Falls, and from them (many of them being done with a patent lens and instantaneously), a much more truthful and pleasing effect is obtained.

The homes of Coleridge, Wordsworth, and Southey, are to my mind unpicturesque enough. I took these as a matter of course, but often, on looking at them, wonder that they were content with such abodes. I can only suppose the natural scenery that everywhere met their eye compensated

them for the unpicturesqueness of their habitations. What, I would ask, can be more hideous than Southey's House at Keswick? for, shut in on every side as it is with trees, can the views, obtainable with difficulty, be said to compensate one? nor is his tomb, on which £1500 was spent, better. This, as is well-known, is in Cresthwaite Church, Keswick,—a full length recumbent figure, tasteless, and little worth what it cost to erect. Three months' pleasant wandering will soon slip away in this fairy land; they should be in mid summer, for as the days shorten and the shadows lengthen, and with the masses of foliage, one misses all the deliciously bright and sunny effects that here so peculiarly throw a charm over the landscape. I accomplished fifty views of various parts of the Lake District, and was quite satisfied with my exploration. A week's revel amongst the treasures of the Art Exhibition at Manchester formed a most agreeable *entr'acte* to the Summer's drama, and the camera remained closely shut up and unused, for verily, had one's time not been wholly engrossed in the Art Treasures Exhibition, there is nothing in Manchester that could by any possibility tempt one to perpetrate Photography. At the expiration of the week I was not sorry to bid adieu to the smoke and cotton palaces and find myself at that most quaint and picturesque town, Chester; for September and October still remained unappropriated, two months of the year, which (now that the seasons are not what our forefathers used to call them), oftentimes afford the tourist the finest and brightest days, and specially favorable to the photographer, wanting, as they do, the excessive glare of July and August. At Chester one may linger with no small benefit; the street architecture, for an English town, being antique and highly picturesque. The Cathedral and St. John's Church and attached Chapel all being very beautiful and affording capital work for the camera; the views around too are very satisfactory: Llandudno, a new watering place of only seven years' growth, was the next place visited, being situated three miles from the Conway station. With Conway Castle I must own to a feeling of disappointment. It is more picturesque from a distance, the interior presenting but few points of interest. On the road to Llandudno, is Glodeath, the seat of Lord Rostyn, which is very pretty and photographic, if I may be permitted to use the phrase. Llandudno abounds with nice bits; the Great Orme's Head and Little Orme's Head forming the boundaries of the beautiful bay on which the town is built. The fine old and rugged limestone cliffs present plenty of points of great interest. The town too is very picturesquely placed. A month soon slipped away at this pleasant bathing-place, and October still remaining, was decided that Bangor should be the next resting-place, and final one for this year. Here are many points of well-known interest, and all easily accomplished. The Slate Quarries of Penrhyn, Penrhyn Castle, the Menai Straits and Tubular Bridge, Beaumaris, and Carnarvon, all within easy reach, and presenting most excellent studies for the photographer. But time and tide wait for no man, and the temperature and shortening of the days warned us that our Photographic pursuits were drawing to a close, and accordingly, after taking most of the salient points, the camera was finally shut up for 1857, after a most fruitful, healthful and instructive tour, with the acquisition of 180 negatives. The meeting with many old friends, and becoming acquainted with several new ones,—the acquisition of health, and the improvement of mind and body,—who need regret, nay, who cannot but feel grateful, to be permitted such enjoyment?—and sordid and miserable indeed must he be who would not profit by such a tour, enhanced, thanks to Photography, a hundred-fold.

Thus, then, let me conclude the Jottings for 1857, in the hopes, that if permitted, I may, in 1858, report fresh progress and fresh experience, for any usefulness that I may be at any time able to impart to any of my fellow labourers in the field is ever a fresh and rich source of gratification to me. Go on and prosper, persevere, and though difficulties beset your path, still in theend the accomplishment is all the more gratifying.

(To be concluded in our next).

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

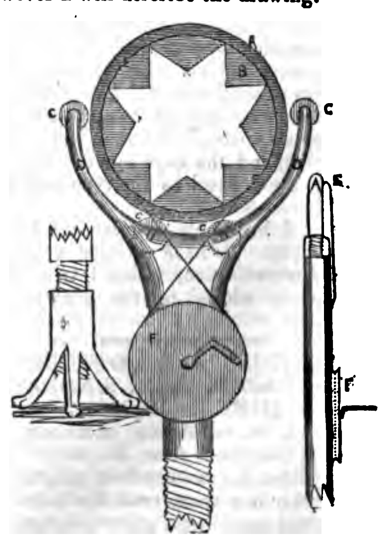
CORRESPONDENCE.

GRADUATED BACKGROUNDS.

To the Editor of Photographic Notes.

Dear Sir,—I send you a sketch of an apparatus for taking vignette portraits, and glass positives. I have heard of such a thing being used, but have neither seen them nor been able to ascertain their mechanism. As you refer to something of the kind in your *Notes* of to-day as being *a kind of secret*, you are welcome to the enclosed if you think it of any use. It seems indeed an act of presumption on my part in sending it to you, it being so simple a contrivance.

However I will describe the drawing.



A. An iron ring of round bar iron, diameter $2\frac{1}{2}$-ft.

B. Eight zinc points soldered inside it, painted white, diameter from point to point, 18-ins.

CC. Four small wheels grooved to fit the wheel A.

DD. Semicircle bearing the rotating wheel A. The two lower wheels working inside it, as shown by dotted lines.

EE. Iron ring acting as a grooved wheel, round which a gutta-percha lathe-cord runs, and over the wheel F.

The other part is sufficiently explained by the drawing.

The wheel F. may be worked by hand, or as a lathe. The apparatus should be about half-way between the camera and the victim, the distance of course being regulated by the sized vignette required.

It is raised and lowered like a music-stand, and stands on three legs. It may be worked very slowly.

STAFFORD S. BAXTER.

Mancetter Manor, Atherstone.

EXCHANGE OF PHOTOGRAPHS.

To the Editor of Photographic Notes.

SIR,—Will you allow me, through the medium of the *Notes*, to call the attention of amateurs to a system for the exchange of photographs which I think will be found satisfactory.

I propose then when an amateur obtains really good negatives, he should make out a list of them and publish it in the *Notes*, offering prints from them in exchange for any others.

The scale of charges for advertising is so moderate that this may be done for a mere trifle, so that by the outlay of a few shillings a handsome collection might be produced from two or three negatives.

The enclosed advertisement will perhaps illustrate my meaning.

JOHN MCWATTERS, JUN.

[ADVERTISEMENT.]

Just published. 5s. each, post free.

Half-plate photographs of GARRON TOWER and GLENARM CASTLE, the most striking features in the Coast Scenery of the North of Ireland.

By sending in exchange two good Landscapes, no matter what subject, Amateurs may obtain Copies of these Photographs.

ADDRESS:

JOHN McWATTERS, jun., English Street, Armagh.

COLLODION POSITIVES.

To the Editor of Photographic Notes.

DEAR SIR,—In my communication to you in regard to a new style of shading the *back ground* your attention seems to have been particularly directed to the tone and colour of the little specimen sent, and you ask "what developer did he use?" &c. Private letters have besieged me on every side, and all making the same request, so I shall be forced to tell the little that I know. As to the picture I sent you, I cannot tell what developer was used, as I use three developers, but I have sent you some other specimens and if they give you the same satisfaction, I will be able to give you the exact formula. You may give this publicity or not as you choose.

J. STUART.

88, Glassford Street, Glasgow.

—Three positives upon glass accompanied the above letter, and we have seen nothing finer than they are. Mr. Stuart's communication will be much esteemed, and inserted as a matter of course. [ED. P. N.]

BLISTERS, &c.

To the Editor of Photographic Notes.

SIR,—I have for some time used methylated alcohol in my negative developer, and find that it gives blacker pictures than when using the ordinary alcohol.

For some months I have given considerable attention to the collodio-albumen process, and have met with great success; my only obstacle being blisters, but I have traced their cause to three sources:

1. Impure hypo-sulphite of soda.
2. Too long immersion in the fixing bath.
3. Pouring the water too strongly on the plates after fixing, because the film being softened and comparatively loose, the water thrown on too forcibly causes the needle-like blisters, which run all over the plate and totally spoil the picture.

My silver bath is *very strongly* acidified, a most necessary thing to ensure clean pictures free from brownness.

QUERIES.

1. Have you any agent in Liverpool for the sale of your collodions?
2. How is the subscription for Mr. Pouncy's process getting on?
3. Can you tell me a way to get the *black* stains off the fingers, formed by the silver and pyro-gallic acid?

Hoping this will find a place in your valuable Journal.

Liverpool. D. TAYLOR.

—See advertisements. 2. See remarks in Leader of the present number. 3. Make a strong solution of cyanide of potassium, and add some iodine to it. Apply a drop or two to the stain, by means of a glass rod. This is a stronger detergent than cyanide alone, because the iodine converts the black organic compound of silver into iodide, and this is immediately dissolved by the cyanide of potassium. [ED. P. N.]

RECEIVED FOR REVIEW.

"The Photographic Teacher," by G. Wharton Simpson.
"Landscape Photography," by Joachim Ottè, F.G.S.

☞ *The Communications of G. Robins; Thomas T. Opie; D. Taylor; "Little Unknown"; T. C. Guiseppi; C. S. Alger; and "Amateur" will receive attention in our next.*

Photographic Notes.

OCTOBER 15, 1858.

We would earnestly call the attention of our readers to the fact that a Subscription List is now open for the purchase of Mr. Pouncy's Process of Printing in Carbon. We publish at page 241, the names of those gentlemen who have already come forward in this matter. As soon as the amount of promised subscriptions reaches £100, we shall call on Subscribers to fulfil their promise by enclosing the amount subscribed to Mr. Pouncy, and the particulars of the process will then be published *in extenso* in this Journal, in a communication from him. In this communication nothing will be kept secret; the entire results of his experiments during the last nine months will be made public. But £100 must first be guaranteed to him, because he has been out of pocket to at least that amount in the prosecution of his experiments. No one with a spark of liberal feeling could object to pay his share for the time and materials which an inventor has expended in perfecting a valuable discovery, and photographers can now, if they choose, obtain the particulars of a valuable process, with the unfettered use of it, on the above easy terms.

Mr. Pouncy's process of printing is now in a very perfect state. During the last few months he has made great improvements in it. The color of the prints may be modified in a variety of ways. The process is more sensitive than that in common use, and so simple that anyone may succeed with it on the first attempt, and the materials are so inexpensive that for a few shillings some hundreds of large prints may be produced. These prints are as good in definition and half-tone as ordinary prints, and require no retouching, but at the same time they are exceedingly well adapted for receiving color when that is thought desirable in portraiture. They have besides this advantage over both plain and albumenized prints, that they hold a sort of middle rank between the two; for the organic matter which attaches the carbon to the paper exists in precise proportion to the amount of reduction by light, so that it is only the darkest parts of the picture which exhibit a glaze, while the fainter portions remain dead. Thus atmospheric effect is not lost in landscapes, through a universal glaze being spread over the picture, as in albumenized prints, while the deep shadows of *near* objects exhibit the richness and vigor due to the excess of organic matter which glazes them and preserves their transparency. In a word, Mr. Pouncy's process, when published, is calculated to effect a complete and immediate revolution in positive printing.

Now, will photographers combine and purchase this process, or is Mr. Pouncy to keep his secret, and work it out commercially in his own way?

We can assure our readers, that everything that has transpired with respect to Carbon Printing has been published in this Journal during the present year, and of all the processes brought forward, none is, in our opinion, in a more advanced state than that which we ourselves discovered, and published in the Leader of No. 42, *except the process of Mr. Pouncy*. That gentleman, acting partly on the hints which we then threw out, and partly on the experience which he had himself gained in photo-lithography, Sella's process, &c., (which processes he had learned from articles published in this Journal), after nine months of indefatigable labour, has brought Carbon Printing to the same perfection as any other branch of photography. This great success having been accomplished, it now remains for photographers to make up their mind whether they will pay a trifle for the knowledge of the process, or remain satisfied with their present imperfect methods of printing.

But these remarks will be read by hundreds of earnest and liberal-minded men, and we have but little doubt of the result. We have but little doubt that the subscription list, although scanty at present, will speedily swell to the required sum, and that many weeks will not elapse before Mr. Pouncy's process of printing imperishable proofs will be purchased, and given by Englishmen to the world. The photographic processes upon paper and collodion are pre-eminently English, and it would be an inglorious thing if the crowning process of all,—viz., that by which direct photographs can be handed down, unalterable, from father to son, and from age to age,—the discovery of an Englishman,—should go unpurchased, and unpublished, while a foreigner may perhaps be on the eve of perfecting and patenting a similar thing. Surely English photographers will now combine and respond to this our appeal for subscriptions, and enable us to report in our next number the good news that the subscription list is complete. But let no one be ungenerous enough to leave it to his neighbour to do that which he ought to do himself. Let *everyone* contribute, be it ever so small a sum, and the thing will be done; but, we fear, not otherwise.

But whatever may be the result of this our second and last appeal, the world shall not remain ignorant of the names of those who act generously in this matter, and come forward in the cause of progress. The list of subscribers, be it perfect or imperfect, shall be published in this Journal; and that list, whatever the result may be, will then become a fact in the history of photography.

Among the valuable papers which have at different times been communicated by Mr. Hardwich to the Journal of the Photographic Society there is probably not one of greater practical importance than his last communication, published in No. 70 of that Journal, in which the effects of using impure nitrate of silver are pointed out. This salt is the most important chemical used by photographers, and it is now evident that on its chemical purity a great deal more depends than has generally been supposed. The experiments made by Mr. Hardwich were briefly as follow:—First, a pure sample of nitrate of silver, made by dissolving pure silver in pure nitric acid, was made into a 30-grain bath, and slightly acidulated with acetic acid;—next, two samples of commercial nitrate of silver, obtained from one of the largest manufacturers of that salt, were made into separate baths of equal strength, and acidified to the same extent as the first with acetic acid. These three baths were then tried one against the other, with the same collodion and developer. The result was that the bath made with pure nitrate of silver gave good negatives in 15 seconds, while the other baths gave negatives which exhibited many serious defects, and required a much longer exposure. The experiments are minutely described in the paper referred to, and were no doubt most carefully made. They lead to the conclusion that nothing but pure nitrate of silver should be used by photographers. With such evidence before him, the practical photographer should now make up his mind to use no nitrate of silver except that which is manufactured by dissolving pure silver in pure nitric acid; and in order to obtain this pure article he must not object to pay a reasonable price for it;—that is, at least five shillings per oz. We should be truly glad to see every photographic firm in the kingdom at once raise the price of nitrate of silver to five shillings, and sell none that is not of guaranteed purity, and manufactured in the first instance from pure silver, totally free from alloy. Or, at any rate, we should be glad to see two varieties kept by the trade, one for those customers who cannot afford to use a cheap and impure article, having neither the money nor time to throw away upon failures;—and, if necessary, another sort kept for those who *can* afford to use a bad article, who *have* money and time to throw away, and who consider failures an agreeable excitement rather than otherwise.

In every branch of photography pure nitrate of silver no doubt yields the best results, diminishes the chances of failure, and increases the sensitiveness of the excited film, or paper;—and in every branch of photography no doubt many of the failures which occur are to be attributed to the impure commercial nitrate of silver which has been so largely supplied to photographers. In the Negative Collodion Process the effects due to impure nitrate of silver are felt chiefly when a new bath is used. Where is the photographer who is not nervous about the qualities of a new bath,—or who has not been dismayed by the extraordinary failures produced by new baths; and what is the proper remedy for this state of things? The addition, first of carbonate of soda, and then of acetic acid, generally succeeds in so far remedying the bath that it gives clean and dense pictures, but this is equivalent to adding acetate of silver; and does not a bath which has been so treated give somewhat coarse pictures? Then again, it is generally admitted that the iron developer gives far finer negatives than pyro-gallic acid, when it can be made to work;—and why can it not *always* be made to work?—why can it be used with one bath and not with another? Why does a bath which gives good negatives with the iron developer to-day, give bad ones with the same collodion and developer to-morrow, rendering the developer muddy and covering the picture with stains? Is it not likely that these things are brought about by impurities in the nitrate of silver which have been overpowered or masked for a time by the addition of an acetate? And again, in the Positive Collodion Process, may not the almost universal bad tone of positives be due to a great extent to the almost universal employment of impure commercial nitrate of silver? And in the printing processes, what is more likely than that impure nitrate of silver may be the fertile cause of the many irregularities which occur in these processes? There is surely no greater mistake than to suppose that any old negative bath, or refuse nitrate of silver, will do for positive printing; on the contrary, we believe it to be quite as essential to use pure fresh nitrate of silver in printing as in any other operation, if brilliant, vigorous, and permanent prints are desired.

The photographer may depend upon it he cannot be too particular in the purity of his nitrate of silver; or, if he be a Daguerreotypist, in the purity of the silver with which his plates are coated. To buy cheap nitrate of silver, or cheap Daguerreotype plates, is certainly false economy, and we shall be glad to see a strong reaction set in in favour of pure silver; and then, when the demand has become imperative and universal, the supply will follow as a matter of course. It has surely been a great mistake of the trade to reduce the price of nitrate of silver. Instead of doing this, the price should have been maintained at 5s. per oz, and the rivalry have been to produce the purest article. Considering that nitrate of silver contains about two-thirds by weight of pure silver, we cannot imagine how a pure article can be supplied at the prices now cited by some of the leading firms. But the fact is the commercial article supplied at these low prices, is *not* fit for photographic purposes, and a totally different process should be employed in its manufacture. That process will be found to consist in first obtaining pure silver, then dissolving it in nitric acid. We know of no other means of obtaining pure silver than by throwing down the chloride from an impure solution of the nitrate by means of salt, and then reducing the chloride, by fusion with soda, to a melted mass of pure silver. This appears to be a necessary first step in the process of making photographic nitrate of silver. Should the nitrate thus made by dissolving the pure silver in nitric acid be found to contain a very slight excess of free nitric acid, it will perhaps be better to leave it alone than neutralize it by adding oxide of silver of questionable purity. With good collodion there is no objection to a *faint trace* of free nitric acid in the negative bath, and for positives excess of nitric acid is a decided advantage, nor is it at all objectionable in the printing processes. The quantity should however be reduced as much as possible by evaporating and re-crystallizing when extraordinary sensitiveness is required. A great clamour has been raised about the free nitric acid in nitrate of silver, but in our opinion the nitric acid is harmless in comparison with other impurities, which are either metallic or carbonaceous.

Our readers may depend upon it that pure nitrate of silver is a matter of great practical importance. The exact nature of the impurities in the salt now commonly sold is very obscure, but their effects are nevertheless very strongly marked, and since they are avoided by dissolving the pure metal in the acid the practical conclusion is that that plan should be generally adopted, and the present mode of manufacturing the salt from mixed metals given up.

We recommend our readers to get "The Photographic Teacher". It is a capital shilling manual of the various processes.

We have received, and read with much pleasure, Mr. Ackland's Hints on Fothergill's Process.

The new lens alluded to in our last number was only forwarded by Mr. Ross a day or two since. Our report upon it will appear in the next number.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

WINTER SESSION, 1858.

The Vice-President, W. Howell, Esq., in the Chair.

The Members of this Society mustered in great strength on Tuesday, September 28th, and the result was a very interesting Meeting.

After the Minutes had been read and passed, the Chairman called upon Mr. Percival Jenns (a non-Member, who had kindly offered to read a paper and exhibit several interesting experiments), to read the following paper :—

THE CAMERA OF NATURE.

In tracing the analogy between the human eye and the camera, it is not my intention to fathom the ocean of time, and dive into the mysteries of the science of optics, as known to the Chaldeans and Egyptians, or to penetrate into the vague hypotheses of Pythagoras, Aristotle, Euclid, or Archimedes, or any others of the primæval schools of philosophy; far easier would it be to become the encomiast of so august a science, than to trace its history, or to follow its progress from the first bursting forth of the embryo germ, to the full development of the perfect plant and ripening fruit. I shall therefore confine myself wholly to those laws of the science which have been deduced from satisfactory experiments by our best authorities in modern times. Consequently, out of the multitude of hypotheses that have from time to time been fabricated for the purpose of unfolding the nature of light, I shall only take notice of two, viz., the atomic and undulatory. But as the atomic will not explicate the latent cause of many of the beautiful phenomena of light; which phenomena may easily (in most cases) be explained by the undulatory, I propose not to dwell upon it more than to take notice that it comes next in importance to that of the undulatory.

Now, by the undulatory theory, we are led to suppose that all space (that is to say as far as we have any notion of), is filled with an imponderable fluid capable of receiving vibrations from a luminous body.

Thus, by the decomposition of coal gas by combustion, we can trace the union of the oxygen of the atmosphere with the hydrogen, and afterwards the carbon of the gas. But we cannot trace any corpuscles of any description, that are evolved to produce light according to the atomic theory. On the contrary, if we weigh the equivalents of carbon and hydrogen contained in the carbonic acid and water, produced, we shall find them exactly of the same weight as before they were disintegrated from the gas. We are therefore led to suppose that the light has been produced, not by the disengagement of any particles, either of matter or of the latent sun's rays, but by an undulation created during the decomposition in that imponderable fluid that has been called ether.

We shall therefore consider white light, not as being made up of three colors; but that all colors are produced by the difference of velocity of the undulation. In the same manner that the numberless multitude of sounds, are only the result of the difference of the undulation of the atmosphere.

The eye is the camera constructed by Omniscience, and is so formed, as to be made susceptible of the most delicate of these undulations. It is somewhat analogous to the tympanum of the ear, which has the power of receiving the most gentle vibrations of the atmosphere. Inasmuch as the one gives us the sensation of light, and the other sound.

We shall do well to consider minutely the construction of this marvellous little camera, for undoubtedly the nearer we bring our artificial ones to it, the nearer will they approach perfection.

On glancing at the diaphram, we shall observe at once, that there is great similarity between them. The sclerotic membrane forms the case of the camera; the choroid being covered with a black pigment, represents its dark lining. The cornea is a transparent substance, composed of a number of thin foils, for the purpose of giving it strength; and covers the front of the eye, and protects it from external injury. The retina is an expansion of the optic nerve, and is analogous to the sensitive plate in our cameras, for it receives the whole of the picture, and by the agency of the optic nerve it is transmitted to the brain. The lens, which in the natural camera is called the crystalline lens, we shall consider more fully when we have taken a casual glance at the two primary laws of optics, viz., refraction and reflection.

By refraction we have to consider the bending of the rays of light when passing from one medium into another of a different density. Thus, when a beam of light passes from a rare medium into one of greater density, it becomes bent towards a perpendicular drawn from its surface; and when passing from a dense into that of greater rarity, the reverse takes place, and it is consequently bent away from the perpendicular. We must here take notice that if the rays fall perpendicularly they suffer no refraction. For example, when the rays of the sun are in a line with the horizon, they become refracted upon entering the atmosphere, and give us the idea of his being higher in the heavens and larger than his apparent size; but when in the zenith they fall in a direct line, and consequently suffer no refraction, and present to us his true position and apparent dimensions. Whereas, when we view the bottom of a stream at an angle from its surface, we are deceived in its depth, it appearing much more shallow then it really is, because the rays of light, having been reflected from the bottom, have to pass from a dense medium into one of greater rarity; consequently, by their being bent upwards, we have the impression of the water being of less depth. How marvellous, when we contemplate, that upon this one simple law depends the whole of the beauty of our refracting optical instruments! Thus, by forming a dense medium in the shape of two spheres cutting each other, and of such a substance as glass, we produce the magnifying lens, without which our cameras, telescopes, microscopes, and even the camera of nature, could have no existence.

[The action of a convex-lens in bringing rays to a focus was here explained.]

It will now be seen how the double convex lens of our camera of nature has the power of collecting the rays of light that are reflected from surrounding objects, and bringing them to a focus upon the retina, and thus impressing it with the miniature picture of the scene towards which it is directed; in the same manner that the lens in our photographic camera transmits the rays and impresses them upon the prepared plate. We might here take notice of one perfection in the natural camera that we can never hope to be able to imitate in the artificial; that is, the circular form of the retina upon which the picture falls.

To regulate the amount of light that enters the natural camera is a very beautiful contrivance, known by the appellation of the iris, and is so constructed as to be able to open and shut according to the amount of light present. Here we have the representation of the diaphrams used in the photographic camera, but being vastly superior to it, in being self-acting; for all photographers know that it is one of the most difficult things they have to contend with to get exactly the requisite amount of light upon their prepared plate. How beautiful then is Nature in all her laws! and what vast amounts of wisdom we may gain by observing and studying her most trivial phenomena.

Having thus superficially glanced at the law of refraction, let us incline our attention for a few moments to that of reflection. Firstly, we shall observe that the sun's rays, upon being reflected upon a smooth surface, follow the same rules as those of the ponderable elements, that is, that their angles of incidence are equal to their angles of reflection. Secondly, that all things are seen by reflection, for the light must first fall upon the object and become reflected within the field of our vision before we can be made sensible of its existence. Upon the former depends the power of all our beautiful reflecting optical instruments, whether it be the telescope, microscope, or looking-glass; and upon the latter, our sight of all-existing things save self-luminous bodies. In speaking of the colors produced by reflection, I might here notice a phenomenon that has always made me strongly in favour of the undulatory theory. If we take a piece of slate that has been perfectly hardened and polished, and heat one end of it in a flame, we shall observe, as it rises in temperature, the whole of the prismatic colors formed upon its surface;

but not in the order of the spectrum, the yellow appearing first, then the red, and lastly the blue. Now it is well-known that steel, tempered at yellow, is the most hard, and at blue the most flexible. It is therefore manifest that the heat has only separated the atoms of the metal at different distances from each other, the blue the most, and the yellow the least. Moreover, it is clear that the molecules of which the steel is built up, must have become sufficiently separated to allow of their free motion, before it could be rendered flexible. If, therefore, its atoms *have* removed slightly from each other, they must have left small spaces between each, capable of altering or retarding the undulation of light that falls upon them; now, as the yellow are nearest together, it is natural for us to suppose that they would produce upon the undulation the least change, and so it is, for we find that they reflect that which we call the luminous ray; whereas the blue, which are the farthest apart, would physically produce the greatest change, and consequently we find them reflecting that color which nearest approaches to black. We are therefore led to suppose that the colors of all objects are nothing more than the result of their different surfaces, and the power they possess of reflecting in a more or less perfect degree the undulation that falls upon them. What can be more grand, and what more beautiful, than the contemplation of so wonderful a contrivance, to present to our view the multitude of colors in all their richness that adorn our finest landscapes? And whether we look at the tints of the morning sky, the blush of the opening rose, the shades of the mighty forest, or the brilliancy of the mineral crystal, we cannot but be struck with wonder and admiration at the beauty of that law, which furnishes such a multiplicity of exquisite phenomena for the gratification of our intellectual pleasure.

Having considered (altho' in a very superficial manner) the two primary laws that govern the science, and the mode by which we are made sensible of the external world through their instrumentality, let us give our attention for a few moments to the great source from whence we derive our light. We are told in Genesis that in the beginning (that is as far as the creation of this planet is concerned) the Divine command went forth, "Let there be light, and there was light;" or, according to the modern exposition, "Let light appear;" for it will be manifest that either of these will signify the same thing, as it is evident that it has relation only to the new-born world, as it had recently come forth from its mother nature, and permitted for the first time to behold the light of the great monarch of the solar system. Now, upon inquiring into the nature of this light, which we have every reason to suppose has possessed the same properties ever since the Cosmogony, we shall find that whether it be produced by atoms or undulations, it is closely associated with two other principals, which, although vastly different in their physical properties, cannot be wholly separated from it, viz: caloric and actinism. However, it yet remains to be proved whether this heat and chemical radiant power does not result from a different manifestation of the self-same principle. However, be this as it may; we know that the combined efforts of these three properties of the sun's rays, enabled the seed in the new-born world to burst from its latent embryo and cover the earth with "grass and herb, yielding seed, and the fruit-tree, yielding fruit after his kind, whose seed is in itself;" so that when man was created and furnished with a double "camera of nature," he might be able to view with stereoscopic beauty, the many wonders of that planet over which, for a time, he has to have dominion. In conclusion, though I may not this evening have broached anything but what all present are familiar with, still I trust that what has been said may serve the purpose of refreshing our memories and making us bear more in mind the marvellous construction of that prototype of which our photographic camera may be considered the type; and doubtless the nearer our artificial ones approach that of Nature's, the nearer will they approach perfection. Moreover, what science is there that is at all times more worthy of our perusal and study, than that of optics? For if we reflect that it grasps at the two infinities and brings them as it were nearer to our comprehensions, (the infinitely large on the one hand and the infinitely small on the other), we must feel that there cannot be a more soul-ennobling study, or one that can give us a more clear insight into the profundities of creation. For if we soar with the telescope into the far distant heavens and contemplate the myriads of worlds revolving in the most perfect order; or view with the microscope a single drop of water, containing thousands of living creatures, all perfect in their organization, the weakest mind must expand with gratitude to the Great Omnipotent who has shewn such power and glory for the instruction and happiness of His creatures, and be ready to exclaim with the Psalmist, "Great and marvellous are Thy works, Lord God Almighty!"

In the course of the reading of the paper Mr. Jenns exibited a beautiful preparation of the eye of an ox, and explained its structure and the analogy between it and the ordinary camera. He also exhibited the experiments of producing color, by the mixture of colorless liquids, the effect being to change the geometrical form of the atoms, and so render the body reflective of different colors.

The thanks of the Meeting having been given to Mr. Jenns for his able paper, Mr. Osborn rose to introduce to the Meeting Herr Pretsch, who had kindly come down from London for the purpose of explaining to them the Petzval Lens, and also to show the pictures produced by it. He would also explain some portions of the Photo-galvanographic process. (Cheers).

Herr Paul Pretsch exhibited two specimens of the Petzval Lens, with a large number of photographs, taken with the instrument. The photographs consisted of portraits and large views, by Rejlander, Llewellyn, Horatio Ross, and other well-

known artists; they speak very highly of the capabilities of these lenses for Landscape purposes. Most of the pictures were of large size, well-defined, sharp to the edges of the picture, and the lines perfectly straight. The distortion usually complained of in landscape lenses seems to be totally got rid of, and the resulting pictures were (even with the full aperture), very straight in the lines. The distances too, are well preserved and faithfully rendered; there is a total absence of the blurring at the corners so often painfully apparent.

The Photo-galvanographs consisted of several unpublished specimens of the process, —the greater number quite untouched; and, (with all due deference to the inventor), there was far more artistic beauty in the untouched specimens than in the doctored ones; for instance, the Bed of the Garravalt, by Roger Fenton, (the master of Landscape photography), would lose a great deal of its grandeur by the addition of any touches of the graver.

Our readers will be already familiar with the description of the Petzval Lens, from the correspondence in the Journals on the subject. It will suffice, then, to give but a few of Mr. Pretsch's remarks, the whole of which were highly interesting and instructive.

Mr. Pretsch observed, in reverting to the early lenses, that Daguerre had used the lens of a telescope, reversed, and although slow in its action, this form of lens gave very good pictures. After some little time, Professor Petzval, of Vienna, introduced the well-known portrait combination, and about a year since the Professor completed the calculations, which have resulted in the form of lens just introduced.

The radius of the ordinary portrait lens is in a curvature of 16-ins., while in the Petzval combination it is only 8-inches, thus giving a flatter and brighter picture. The new lens then possesses superior and peculiar properties, and we claim for it three capabilities, viz.,—1. Perfect sharpness of delineation to the edge of the picture. 2. Correctness of perspective. 3. Proper effect of distance.

If the operator has proper time and distance of station to choose from, and can select his own point of view, then, with a small diaphram, it is not to be denied that the ordinary view-lens will produce very good pictures; but these requirements are not always to be met with. [The large lens exhibited had a focal length (for views) of 26-ins., and a combined focus of $8\frac{1}{2}$-ins., the portrait combination taking pictures $8\frac{1}{2} \times 6\frac{1}{2}$. The smaller lens, for views only, had a focus of 18-ins., and covered a plate $13\frac{1}{2} \times 11$. The full combination consists of three pairs of lenses only, two pairs of which are required to be used at once.] Mr. Pretsch observed that it was necessary, in some cases, to have a camera constructed for the purpose, with a swinging back, so as to adjust for near and distant objects, also for foreground and sky; for copying maps, and other surfaces of that kind, the article should be slightly curved, as in the case of arrangement of groups.

Mr. Pretsch then proceeded to explain the details of his Photo-galvanographic process. He stated that by its means any picture that could be rendered transparent could be copied, and that by the powers of re-production the supply of proofs was unlimited. He alluded to the advantages and permanency of printer's ink over the photographs, —not only in the command of the tone produced, but in the durability. The problem of engraving by light had occupied the attention of scientific men ever since the discovery of photography, and various means had been tried, such as etching, to engraving, partly by light and partly by hand; but his process, when brought to perfection, would be independent of all extraneous help; it would be a purely natural process; the picture would be drawn by light and engraved by electricity. As regards the touching up of some of the plates, that was at present unavoidable, but he hoped it would not be necessary in a very short time.

In alluding to Mr. Fox Talbot's new process, Mr. Pretsch said, that a gelatine preparation similar to his own was used, but for the purpose of regulating the permeability when etching upon the steel. By the new processes just patented the copper plates might be made as hard and as durable as steel. (Applause).

[The engravings and photographs exhibited by Mr. Pretsch were the theme of general admiration to a crowded audience.]

Mr. Rejlander, in moving a vote of thanks to Mr. Pretsch for his very interesting communication, said, that he had tried the Petzval lens, but was not quite used to it at present; its action, in one or two cases, had been so rapid, as to produce overdone pictures in less than one second. He should, however, continue his experiments, and would communicate them to the Society.

Mr. Osborn then read a paper, communicated by Mr. Sutton, of Jersey, entitled, "Suggestions for some Improvements in the Camera, and Mounting of Lenses." [*See last Number.*]

A vote of thanks was given to Mr. Sutton for his paper, and also for the present of his Dictionary to the Society's Library.

Mr. Osborn, in acknowledging for Mr. Sutton the vote of thanks, said, that the Society was greatly indebted to the gentlemen who had given them papers that evening, and who, at the cost of considerable time, labour, and expense, had favoured them with such valuable information. He was glad to see such a numerous attendance, and while the Council would spare no trouble to render the Meetings interesting, he hoped the attendance of the Members would continually increase. He regretted that there was no time left for the discussion of the papers they had heard,

but he would propose that the after part of the next Meeting should be devoted to that purpose.

It was then announced that the next Exhibition of the Society would be opened at Aston Hall, on the 1st of March, 1859, so that the Members would have plenty of time to prepare specimens. The Managers of Aston Hall had granted them the use of a room as a permanent Exhibition.

The Annual Meeting of this Society will be held October 26th, 1858.

BRITISH ASSOCIATION.

Extract from Sir John Herschel's Speech at the Meeting of the British Association at Leeds.

"If the phenomena of chemistry are ever destined to be reduced under the dominion of mathematical analysis, it will, no doubt, be by a very circuitous and intricate route, and in which at present we see no glimpse of light. We should, therefore, be all the more carefully on the watch in making the most of those classes of facts which seem to place us, not indeed within view of daylight, but at what seems an opening that may possibly lead to it. Such are those in which the agency of light is concerned in modifying or subverting the ordinary affinities of material elements, those to which the name of actino-chemistry has been affixed. Hitherto the more attractive applications of photography have had too much the effect of distracting the attention from the purely chemical question which it raises; but the more we consider them in the abstract, the more strongly they force themselves on our notice: and I look forward to their occupying a much larger space in the domain of chemical inquiry than is the case at present. That light consists in the undulations of an ethereal medium, or at all events agrees better in the characters of its phenomena with such undulations, than with any other kind of motion which it has yet been possible to imagine, is a proposition on which I suppose the minds of physicists are pretty well made up. The recent researches of Professor Thomson and Mr. Joule moreover have gone a great way towards bringing into vogue, if not yet fully unto acceptation, the doctrine of a more or less analagous conception of heat. When we consider how the marked influence which the different calorific states of bodies have on their affinities—the change of crystalline form effected in some by a change in temperature—the allotropic states taken on by some on exposure to heat—or the heat given out by others on their restoration from the allotropic to the ordinary form (for though I am aware that Mr. Gore considers his electro-deposited antimony to be a compound, I cannot help fancying that, at all events, the state in which the antimony exists in it is an allotropic one),—when, I say, we consider these facts in which heat is concerned, and compare them with the facts of photography, and with the ozonization of oxygen by the chemical rays of the electric spark, and with the striking alterations in the chemical habitudes of bodies pointed out by Draper, Hunt, and Becquerel; and when again we find these carried so far that, as in the experiments of Bunsen and Roscoe, we find the amount of chemical action numerically measuring the quality of light absorbed—it seems hardly possible not to indulge a hope that the pursuit of these strange phenomena may by degrees conduct us to a mechanical theory of chemical action itself. Even should this hope remain unrealized, the field itself is too wide to remain unexplored, and, to say nothing of discovery, the use of photography merely as a chemical test may prove very valuable, as I have myself quite recently experienced, in the evidence it has afforded me of the presence in certain solutions of a peculiar metal having many of the characters of arsenic, but differing from it in others, and strikingly contrasted with it in its powerful photographic qualities, which are of singular intensity, surpassing iodine, and almost equalling bromine."

PAPERS READ ON PHOTOGRAPHY.

Paper read by W. Sykes Ward, Esq., on the "Dry Collodion Processes."—He observed that some apology was due from him for occupying the time of the section with this subject, as he had already introduced it at Cheltenham, and again last year at Dublin; but in the dry process he thought there was more scope for investigation than in any other department of photography, and he mentioned the continued researches and experiments of both French and English photographers on the subject; a result of which being that they had a vast number of different processes published—so many, indeed, that they were likely to create some confusion. There was, however, an advantage in their variety, as most of them were capable of modification and interchangeability, so that an operator might adapt each to his own particular requirements. It had been objected to the use of many of the methods proposed that they required so much manipulation; but, in his opinion, the great thing to be aimed at was a superior result, and certainly he was no true artist who objected to one or two more operations, provided a successful result were attained. Indeed, many of the operations were more for the purpose of correcting errors or removing stains than necessary parts of the process. He then detailed a variety of the dry processes, referring in terms of high eulogy to that proposed by Mr. Maxwell Lyte, in which a film of meta-gelatine is used. This process, he thought, had not obtained the notice of which it was well worthy. It had been urged that the dry process had mostly failed in the production of views of the foliage of trees and of water in motion, but in this respect Mr. Lyte's process was singularly successful. He might state, in conclusion, that none of the dry collodion processes that had come under his notice were so sensitive as they were represented to be, although that was a matter of minor importance as it regarded small pictures, especially such as were used for the stereoscope; yet it was of much consequence in larger pictures.

Mr. R. J. Fowler next read a paper on a "Process for the Estimation of Actinism."—He said that in drawing the attention of the section to the estimation of the actinic force of the solar radiations his object was rather to add what he presumed were new facts to the science of actinometry than to present a perfect and complete process in every respect. In the 9th volume of *Gmelin's Handbook of Chemistry* he found it stated that "Oxalate of ammonia, mixed with aqueous proto-chloride of mercury, is decomposed under the influence of light, yielding sal-ammoniac, calomel, and carbonic acid;" it also stated that "the mixture of the two solutions remains clear in the dark; in daylight it becomes turbid in six minutes, and in the course of an hour deposits calomel, which in sunshine quickly falls

down in soft flakes, surrounded with bubbles of carbonic acid. The filtrate no longer contains mercury, but chloride of ammonia and undecomposed oxalate of ammonia." On seeing this he was at once struck with the idea that here might be the elements of a process for actinometry, and whether this was the fact, he left them to judge from the experiments he had tried on the subject. He found it true that the solutions might be kept unchanged for an indefinite period, in the dark; that the calomel began to precipitate in from 15 to 20 seconds in full sunshine; and also that the precipitate ceased immediately the vessel containing the solution was removed from solar influence, thus showing that the action is not continued in darkness, even when the change has been partially effected, and that the action of the actinism is not in this case catalytic. He had also exposed three tubes containing the mixed solutions to pretty uniform light, No. 1 for ten minutes; No. 2 twenty minutes; No. 3 forty minutes; the results being that No. 2 contained twice the bulk of precipitate of No. 1, and No. 3 twice the bulk of No. 2. When the solutions were exposed several hours the vessel containing them was found to be completely filled with a magma of the precipitated calomel. From these experiments it appears conclusive that the mixture of solutions of oxalate of ammonia and proto-chloride of mercury is very sensitive to light, and as this action of light is not catalytic, the precipitate obtained may be considered as produced by solar influence alone; and lastly, that a definite amount of precipitate is produced by a definite amount of actinic force; thus proving that there are elements of certainty and uniformity in the behaviour of the mixed solutions when exposed to solar influence, from which a certain method for estimating the actinic force may be formed. If extreme delicacy were required in the estimations, the precipitate might be collected, dried and weighed; but, where this was unnecessary, graduated tubes might be used for exposing the mixed solutions, and from which, after standing a certain time in the dark, the amount could at once be read off. Mr. Fowler stated that in his experiments he had used a nearly saturated solution of the two salts, but this was by no means necessary, as he found that, if a drop of the solution of proto-chloride of mercury, containing one 1-1500th part of a grain of that salt were added to 300 grains of the solution of oxalate of ammonia, and exposed to the light, the calomel would still be precipitated. The reaction in fact being so delicate that it might be used as a confirmatory test for the presence of proto-chloride of mercury. He stated in conclusion that it would be interesting to know how the absorbed actinism of M. Niepce de St. Victor would affect the solutions. He had made some experiments in that direction, but not with sufficient success to warrant any positive assertions.

At the close of Mr. Fowler's paper, no immediate remarks being made on the subject, Mr. Mercer, F.R.S., exhibited several specimens of Chromatic Photographs, some being on calico, or a similar fabric, produced by previously soaking the material employed in a solution of per-oxalate of iron; the effects produced were both singular and novel, and the method promises to lead to photographic color-printing; it is at least a step in that direction. As te photographs were being handed round for examination, Mr. Mercer gave a few brief explanations of the circumstances that led to their production.

Mr. W. Lyndon Smith read an interesting paper on the "Choice of subject in Photography, and the adaptation of different processes." He said it was the grand reproach thrown against photography that it was a merely mechanical operation, and that its votaries need not necessarily possess taste, imagination, or even a knowledge of the rudimentary elements of pictorial art. A writer in the last number of the *Art Journal* states that his object is to show that no mechanical process can long supersede the living agency of man's mind, and that photography is and never can be anything more than a servant of servants; and the writer proceeds in a long and tedious exposition to prove by arguments, neither novel nor ingenious, the utter inadequacy of photography to maintain the position in which its admirers would place it. Now these remarks, he was aware, would not make the slightest impression on genuine disciples of the art, but he introduced them because adverse criticisms were in some measure merited by the ill choice of subjects the majority of photographers, both professional and amateur, had made, the former generally styling themselves photographic "artists," but with what impropriety their specimens too often showed. However, within the last two years there had been very great improvement. The *art* in the first days of photography was totally lost sight of in the excitement produced by the marvels of the *science*, and it is but lately that the camera has been transferred from the hands of the chemist, (who has taught us indispensable knowledge, and to whom we could not be sufficiently grateful,) to the hands of the artist, who now demonstrates daily the beauty and truth of its representations. The most common subjects represented have been architectural views, and the French photographers have arrived at a great amount of perfection in this department, yet, in even the best of their pictures, there is often a want of taste in the point of view selected. They are too often taken from an elevation, to prevent the inclination upwards of the camera, which causes the upright lines to converge, and, consequently, there is a loss of magnitude, and the beauties of perspective are diminished. Again, they are generally full front instead of in perspective, which latter position is always more picturesque. But it is in landscape that the glorious fidelity of the camera, when its direction is controlled by the true artist, is most evident. None but he can experience the delight of catching the most transient effects of ever-changing nature. It is in this direction that the glorious future of artistic photography lays, and the true lover of nature will delight more in a specimen of this class than in scores of hasty sketches, even by clever men, or in the gaudy and meretricious coloring of the pre-Raphælite, vainly attempting to delineate, by the hand, that which the sun himself paints for us in the photograph. Photographers are generally too frightened of getting the sun in the camera, as they say, to take their views with its back to their best friend, and thus they lose all the cross shadows which give a stereoscopic effect to a picture, and, in fact, get hardly any shadow at all; as with the sun in the position mentioned, the shadows are all behind the different objects composing the view. He had invariably found that the most pleasing pictures were taken with the sun shining right on the front of the camera, and in this case the precaution must be taken to shield the lens from the direct rays of the sun by the hand or otherwise. Water in motion is rarely reproduced with success, except in instantaneous views, and for the present that must be left to the painter, who, by the aid of white paint and hard brushes, can give us any amount of cataract. The painter himself even condescends to use the

camera for the depiction of foliage and herbage, and photographic studies of foreground are most generally admired for the extreme delicacy with which the veinings and markings of the tenderest herb or flower are delineated; still it must not be forgotten that foregrounds are most lovely when adjuncts to an extended view. The study of composition is as necessary to the photographer as to the painter, and every student of the art may derive much benefit from the study of J. D. Harding's "Principles and Practice of Art," which, containing much from which many will dissent, conveys to an inquirer much useful and practical information. With reference to the latter portion of his subject, Mr. Smith mentioned that calotype paper was, in his opinion, suitable for giving bold effects, though open to objection on account of its want of clear definition and its granular surface. The wax paper was more homogeneous, but both methods are now generally exploded. Albumen on glass gave exquisite definition, and was most successfully used for taking engravings and paintings, on account of the clearness of lines and the absence of dirtiness in the white parts, a fault to which collodion is liable. In his opinion the albumen on glass process could not be improved upon by any of the modern processes to which Mr. Ward had alluded. Undoubtedly the collodion process was the best, notwithstanding the inconvenience attending its use. The collodio-albumen process, so much advocated at present, appeared to him extremely unsatisfactory, though the confidence of its supporters was unbounded; and as to the dry collodion process, by it no satisfactory effects have yet been produced, though every effort had been made by its advocates. He concluded, by hoping that the remarks he had made might excite discussion, that so any fallacy might be confuted, and any truth confirmed.

The Rev. W. V. Harcourt, who had taken the chair in the absence of the President, deprecated any lengthened discussion, on account of the time.

Mr. W. S. Ward said the thanks of the section were due to Mr. Mercer for his experiments, and in reference to the last paper remarked that he could not agree altogether with its author as to artistic difficulties. A tyro in the art would do anything, but a photographic artist could only become one by repeated trials. He did not consider it to be right to change photography from a science to an art; and genuine artistic effects were produced through photography being under the dominion of the chemist and physicist. To secure the full effect of foliage and of water much exposure was absolutely necessary. The great practical difficulty was to hit the right point between under and over-exposure, as the effect of light was more powerful at first than afterwards. He might say that the less a photographer was satisfied with what he had accomplished the more likely was he to succeed better in future.

Mr. Smith said that he believed the simpler the manipulation and materials the better. He thought the dry process a complete failure. Photographers might be divided into two sections; the scientific, who sought out and experimented upon complicated processes; and the artistic, whose great object was to produce the best effects.

Dr. Odling observed that some instruments had been used by Bunsen and others to determine the actinic force, but they were entirely out of the reach of the ordinary practitioner. He trusted Mr. Fowler would proceed with his researches, and inquired if the decomposition of the solution referred to had proceeded *pari passu* with the length of exposure?

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Total to October 5th.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

PHOTOGRAPHIC BATHS AND DISHES.

To the Editor of Photographic Notes.

Sir,—I have lately seen many letters concerning baths and dishes for photographic purposes, some and as it is frequently offered to the public, there

advocating porcelain, some gutta-percha, some glass ones, and others again recommending a combination of the two latter. Gutta-percha has the advantage of strength and lightness for travelling purposes, but I don't like it; you cannot see if it is clean; and as it is frequently offered to the public, there is considerable mischief done to the nitrate of silver. My travelling baths are of gutta-percha, and varnished inside with shellac, as recommended by some writers; this is certainly an improvement; but a slight deposit still forms now and then; all resins and gums precipitate silver, and I fancy that the shaking about disturbs the first-formed deposit, thus again exposing the gum to the action of the liquid.

In the last number of the Photographic Journal, page 32, the Editor recommends a *porcelain* bath; now I have never seen a *porcelain* bath, and not even a *porcelain* dish, of English manufacture; those made in England are of common earthenware, soft, glazed over, and I do not hesitate to call them rubbish; the glaze soon cracks all over, and then they are worse than useless.

I happen to possess some French dishes of which I can speak very favorably; they are of white *porcelain*, (real porcelain), hard burnt, and vitrified through their whole substance; depth an inch-and-a-half inside, with the edges ground level, so that a glass plate laid over the top forms an air-tight cover; the name on them is GUILLOUX; they come from Paris, as iodizing pans for large Daguerreotype plates, and after four years constant use, with all sorts of liquids, they are as good as ever. Now, why cannot *our* china manufacturers make the same sort of thing,—or rather, why don't they? Are we always to look to other countries for improvements in such articles?

The glass upright baths we see in London are certainly very nice things, but do you really know any one who travels with one of any considerable size? I don't; and for this reason: they make them so wide, that it takes an awful lot of liquid to fill them. A glass bath, 12×10, as at present made, is an inch-and-an-eighth wide inside, all the way down, requiring about *half-a-gallon* of solution to fill it, and this, with water-tight cover and case, will probably weigh 15 or 20lbs. I can afford the price, but I cannot afford the weight and inconvenience of such a bath; therefore, my indoors bath I made with plate glass and marine glue, and my travelling baths are of gutta-percha.

Now, what is the use of this width of an inch-and-an-eighth? The V-shaped baths, made by the late F. Scott Archer, were a step in the right direction; and why cannot we have a V-shaped bath of glass or porcelain, (mind no common earthenware for me), say 12×10-ins., about three-quarters-of-an-inch wide at top, and three-eighths-of-an-inch wide at bottom; such a bath would hold rather less than a quart when full. This would be much more portable, and the width quite enough for any but the most clumsy operator. I have used a bath for plates 8-ins. square, which was only three-eighths-of-an-inch wide at top, and found no difficulty *out of doors even*. The sellers of the present glass baths will tell you, that the strength of a small quantity of nitrate solution is soon exhausted; but it is easy to carry nitrate of silver and drop in 5 or 6 grains for every ounce of collodion used up.

Now, Mr. Editor, you will, I know, have all sorts of objections made, particularly to my last suggestion of narrow porcelain baths; some will say they can't be made; and others will declare that they can't be used if made;—to such I can only say, "try first and form an opinion afterwards." The actual quantity of nitrate solution taken up by a large collodionized plate is only two or three fluid drachms, and for the sake of this small quantity, we are compelled to carry a half-a-gallon about with us,—very clever, certainly, for the nineteenth century.

I formerly worked upon 8-in. plates, and by way of showing how I succeeded with the above-mentioned bath, three-eighths-of-an-inch wide, I enclose a spoiled print for your inspection. I am now more ambitious, having got to plates 11×9, and am at once met with the inconvenience of increased bulk and weight. If you will assist in getting rid of these difficulties, you will I think, do good service to the art generally, as well as to

Your obedient Servant,

"SIMONIDES."

CREAMY LIGHTS.

To the Editor of Photographic Notes.

SIR,—Seeing a query in your *Notes* of July 1st as to getting cream-colored lights, I think the effect would be obtained by omitting the nitric acid (if any) in the developer, and substituting acetic acid, 6 or 8 drops to the ounce of water, and 10 grains proto-sulphate of iron.

D. TAYLOR.

Brookfield, Liverpool.

STEREOSCOPIC EFFECTS.

To the Editor of Photographic Notes.

DEAR SIR,—Will you allow me to set you right with regard to *curing* a nitrate bath by setting it in the sun. If you refer to the "Photographic Journal," for Nov., 1853, you will find Mr. R. Fenton says as follows:—"If, at the close of a day's work the bath begins to show signs of an alkaline condition, it is easily restored to working condition by exposing it to the sun's rays, &c."

And will you oblige me, by telling me how to account for the *fact*, that if two pictures are taken from *one* negative and mounted as a stereograph, and looked at with a prism, or whole-lens stereoscope, that stereoscopic effect is produced, that is, that everything on the picture assumes its proper place and distance. Several pictures have been so mounted, and gentlemen that have seen them cannot perceive any difference between them and others properly taken; namely, at a given distance apart. I do not know how the half-lens stereoscope acts, as they are never used about here.

I cannot tell how they act myself, as I have had the misfortune to nearly lose the sight of one eye, and so of course cannot see these things for myself, and therefore I apply to you for an explanation. Perhaps you would mount two pictures in this way and let me know what you think of it.

Will you impress on photographers who take collodion positives the fact that collodion positives fade if not varnished.

Huntingdon. G. ROBBINS.

—We have known persons assert that they perceive stereoscopic effect, when the pictures have been improperly placed, and the effect is in reality pseudoscopic. There is a great deal in imagination. The *fact* is that prints from the same negative cannot, under any circumstances, or viewed through any kind of instrument, give *true* stereoscopic effect.

[Ed. P. N.]

DRY PROCESSES.

To the Editor of Photographic Notes.

Sir,—Some time ago a letter appeared in the "Times" signed Thos. Fothergill, professing to give complete instructions for a successive mode of taking photographic pictures by the Dry process. I have tried this and several other methods, with the greatest possible care, but regret to say the only results that I have had have been trouble, expense, and disappointment. *In a state of despair* I appeal to you, or some of your contributors, to know if any process is really known by which photographs may be taken by the "Dry Process," or is the pursuit of this great desideratum a "Will-o'the-Wisp"?

Amateur.

2, Albert House, Scarborough.

—Of all Dry Processes, by far the best that we have tried is Dr. Hill Norris's. It answers perfectly, and the plates may be kept a year.

Have nothing to say to any honey, or albumen, or oxymel process. [Ed. P. N.]

ACIDITY OF COLLODION.

To the Editor of Photographic Notes.

Dear Sir,—I have a bottle of collodion, rather acid, whether from old ether, (the cotton being imperfectly washed) or from what cause, I don't know. When iodized it will do, but being rather high-coloured, I fear it may acidulate my bath. Be so good to say in your next whether soda-ammonia or potash would do to add to the plain collodion in minute quantity, and if so, which is best?

Have you *Oleum Vini* in your Dictionary? Some time ago, when working large glass positives, I found 6 drops to one pint of developer caused it to flow over any size plate without a stain. I took the notion from its property of causing ether to mix with water, a portion of which, *i.e.*, ether, remaining for some time in good-bodied collodion after coming from the bath. No doubt it would be equally useful in negatives.

Thos. T. Opie.

St. Agnes, Sept. 10th.

—**Dissolve caustic potass in alcohol and add a drop or two to the collodion; it will remove all the redness by causing the free iodine to combine with the potassium. But if the pyroxyline should be decomposed and rotten, this will not restore the collodion to good working order.**

[Ed. P. N.]

DARK TENTS.

To the Editor of Photographic Notes.

Sir,—In Mr. J. Archer's paper, inserted in the last *Notes*, information is sought as to the best form of tent for working plates 9 × 7. The following very simple contrivance I have found to answer the purpose admirably:—A tent, one yard square and 6½ high, is made of black Holland, lined with one thickness of yellow cambric: the only support required is two splines, placed diagonally, inside, at the top, and a piece of stout card passed through the centres of the splines and tent, and thrown over the branch of a tree or any other projection at hand, in the shade. The tent is thus drawn up to the proper height, and fastened at the bottom by pegs and loops at each corner.

The entrance at the corner is fastened by three buttons, and the light effectually excluded by means of a lap of yellow cambric inside.

A small square of the black Holland is cut out at the proper height, and two or three thicknesses of yellow cambric inserted in its place to form the window; this completes the tent, which can be pitched in less than five minutes, and when taken down can be folded in a small roll and carried under the arm without the least inconvenience. The splines (weighing only a few ounces) can be packed up with the camera legs.

The entire cost does not exceed 12s. or 14s. I have used it with great comfort and invariable success, and strongly recommend its adoption by all practitioners of the wet collodion process.

The accompanying view of Framlingham Castle was printed from a negative developed in a tent of the above description on a *windy* day.

Charles S. Alger.

Diss, September, 1858.

WET v. DRY COLLODION.

Sir,—"For after all what is any man's *ipse dixit* worth, *without the guarantee of a specimen?*"

I take this sentence from page 208 of your number of *Notes*, for September, as my text, and have to complain of the off-hand way in which some of, indeed I may say all, the writers in the journals state how actively their plates work, taking a "*picture*" in 25, 30, 45, seconds, and so on, without informing us what *kind* of picture it is, whether is it a *house*, a *grove of trees*, or what? Let them state that important particular, and I'll ask no other guarantee, except, in all good faith, I trust to their honour, that the "picture," is a *prime one*, and not a failure.

In your interesting account of your photographic trip lately, I agree fully in one remark, "that when you have all the requisites by you, there is nothing like the wet collodion process."

I may safely say, that no one has worked harder than I have at the dry processes, and I think, as well as I can judge in this remote place, *without seeing* the "guarantees", that I have succeeded at least as well as my brother photographers; but I have now settled down to the collodion process, and am now beginning really to *enjoy* photography. Before, it was late nights, and many weary hours of toil in the dark room, with their attendants—pale face, jaded limbs, and reduced health; now it is all open air and sunshine, with their attendants—good health, good spirits, good appetite, and *good pictures*, and no mistake.

I do my work with a very portable dark box of my own design and workmanship; the pictures are all begun and finished in the open air, under the blue canopy, free from suffocating odours, and they yield me the full enjoyment on the spot of the beautiful and delightful wonders of our fascinating art. In conclusion, if you receive this letter kindly, I may be induced to send you some "guarantees" (I like the word) of my dark box.

R. HAINES.

82, Grand Parade, Cork, Sept. 1858.

"*J. McGowan, Wigtown.*" Your nitrate of silver was probably largely adulterated. Add more to the bath, and it will no doubt work well again. [ED P N.]

"*J. Archer, Manchester.*" Your prints have darkened all over in the process of development, from a cause which we cannot clearly explain, although the same thing has repeatedly happened in our own experiments upon Canson paper. We attribute it to the free alkali contained in that paper not having been completely neutralized. The resin with which French paper is sized is dissolved in soda,—hence the alkalinity of the paper. M. Blanquart Evrard has invariably printed by development upon Canson paper, and his method has been to acidify the nitrate bath with *nitric* acid, and float the paper for fifteen minutes upon it. Many of the failures in the Wax Paper Process have no doubt been owing to the alkalinity of French paper. Hollingworth's paper is acid and always works clean, It is impossible to use French paper in the Calotype Process. [ED. P. N.]

"*C. Green.*" The best developer for instantaneous negatives is composed thus,—

Distilled water.........1 ounce
Proto-sulphate of iron...5 grains
Acetic acid.............5 minims

When the collodion and nitrate bath are in good order no after-intensifying is required, nor need any silver be added to the developer.

For the method of whitening glass positives see the "Photographic Teacher," published by Messrs. Squire & Co., 52, King William street, London Bridge. [ED. P. N.]

"*T. C. Guiseppi.*" No. 1 Portrait lens will do for magic lanterns. Use the oxy-calcium light. [ED. P. N.]

"*L.H.*" Consult our Dictionary on the article Micro-Photography. Remember your object glass is not achromatic, but over-corrected for violet rays. [ED. P. N.]

"*An Amateur Printer.*" Excited albumenized paper ought to keep two or three days. Your eggs were perhaps stale, or your nitrate of silver bad. Mount your prints with fresh starch, and damp the cardboard with a wet sponge. [ED. P. N.]

"*A.H.D., Edinburgh.*" A good collodion for dry processes may be made by acting on cotton wool for five minutes with the strongest commercial oil of vitriol, and nitric acid, S.G. 1·42, in equal parts, at a temperature of 160°. The gun-cotton is rather short, and the collodion fluid, structureless and porous. Freshly made collodion gives the most sensitive film. [ED. P. N.]

"*F. Stafford, South Shields.*" Anthony's collodion is very good, and preserves its sensitiveness, although sold ready iodized. Mr. Atkinson, of Liverpool, imports it. [ED. P. N.]

"*Enquirer.*" The oxy-calcium light is the best for printing purposes at night. The oxygen is easily made in a copper retort on the kitchen fire, and there is no risk whatever of explosion. The light is extremely white and powerful. You will see the entire apparatus at any optician's. The condenser of a magic lantern will answer your purpose better than reflectors for concentrating the light upon the negative. The oxy-calcium light is produced by passing a jet of oxygen through a spirit lamp and causing the flame to play upon a ball of lime. [ED. P. N.]

"*F. Scrivener, Bury.*" The method of enlarging negatives will form very shortly the subject of an article in this Journal. [ED. P. N.]

"*J. Farmer, Edinburgh.*" We cannot perceive any utility in adding chloride of ammonium to nitrate of uranium. [ED. P. N.]

"*Z.Z.Z.*" We cannot tell how long paper will keep after having been excited by the process described in No. 12;—but the best keeping paper for a week or so we find to be Hollingworth's thin negative paper. French paper does not keep at all unless it is waxed. [ED. P. N.]

☞ *The Communications of John Horsley, F.C.S.; A. B. C.; Mrs. Collins; J. W. G. Gutch; and J.; will receive attention in our next.*

Photographic Notes.

NOVEMBER 1, 1858.

Our readers will remember that about six months ago Mr. Pouncy patented provisionally his process of Printing in Carbon. In taking this step certain particulars relating to his process were described in a document deposited at the Patent Office, to be kept secret for six months, according to the Patent Laws, and then made public. The six months having now expired, and Mr. Pouncy not having completed his patent, these particulars of his process have become public property, and we are of course at liberty to publish them.

Mr. Pouncy's Provisional Specification is as follows :—

Pouncy's Process of Printing in Carbon.

No. 780.—JOHN POUNCY, of High West Street, Dorchester, in the County of Dorset. 'Improvements in the production of Photographic Pictures.'—*April* 10*th*, 1858.

"I, John Pouncy, of High West Street, Dorchester, in the County of Dorset, do hereby declare the nature of the invention for "Improvements in the production of Photographic Pictures," to be as follows :—

"This invention has for its object improvements in producing photographic pictures on paper and other surfaces; the surface has usually been prepared with substances which, when acted on by light in the process of producing the picture, are chemically acted on so as to produce (either immediately, or when other substances are applied afterwards to the surface,) the coloring matter, or substance, in which the picture is formed. Now, according to my invention, I prepare the paper, or other surface for having the picture produced on it, by applying over its whole surface the coloring matter which is to form the picture, and together with this coloring matter, is applied a substance which is acted on by the light. The following is the manner in which I proceed when printing positive pictures on paper from negative pictures :—I coat the paper, or surface which is to receive the picture, with a composition of vegetable carbon, gum arabic, and bi-chromate of potash; and on to this prepared surface I place the negative picture, and expose it to the light in the usual way; afterwards, the surface is washed with water, which dissolves the composition at the parts on which the light has not acted, but fails to affect those parts of the surface on which the light has acted: consequently, on those parts of the surface the coloring matter remains in the state in which it was applied, having experienced no chemical change. Sometimes, for the vegetable carbon, I substitute bitumen; or other coloring matter may be employed.

"By this process, pictures are obtained which are not liable to fade like ordinary photographs."

Such then are the main features of Mr. Pouncy's process.

Now the Subscribers for the purchase of Mr. Pouncy's process will have to consider whether they will remain content with the above particulars, which are exceedingly imperfect, or carry out the original plan, and purchase from Mr. Pouncy the FULL particulars of his process, with the view of giving publicity to the whole secret of the manipulation. We advise them strongly not to desist from their original intention. The mere knowledge that Mr. Pouncy uses bi-chromate of potass, vegetable carbon, and gum arabic, is not enough to enable anyone to succeed at once in getting such a print as that which we last received from Mr. Pouncy. The proportions of the ingredients, the mode of mixing them, and of applying them to the paper, are not described in the Provisional Specification, nor is any allusion made to the particular kind of paper which it is really necessary to employ. The experience of six months has enabled Mr. Pouncy to produce very much better specimens than those which he exhibited at the last Exhibition of the Photographic Society, and those who purchase from him the full particulars of the process which he now uses will be able to get good pictures at once, and will gain information which it would be very important to publish. Nevertheless we cannot disguise from ourselves or our readers the fact that the publication of the main feature of Mr. Pouncy's process releases Subscribers from any promise they may have made, and puts the matter of the Subscription on a somewhat different footing from before. So far as we are concerned we shall be happy to carry out our part of this affair by publishing the Subscription List, when complete, and the process when purchased ;—but at present we do not quite see our way clear in the matter. It remains now for Mr. Pouncy himself to come forward and state clearly what his intentions are, and whether he will now, for a certain sum, publish his entire process, and inform Subscribers how they are to arrange matters with him. We place this Journal at his service and that of his Subscribers for accomplishing the object they may have in view; and we have written to him urging him to take a decisive step in this matter. We have all along understood from him that the document deposited at the Patent Office contained no information from which any one could produce prints similar to his, and our surprise was therefore extreme when we received from the Patent Agent the paper published in this number. Nevertheless a great deal remains untold, and if £100 would purchase that information, it would be money well laid out, and at the same time fairly earned by Mr. Pouncy.

The history of Carbon-Printing may now be briefly told ;—

In 1838 Mr. Mungo Ponton described in the Edinburgh New Philosophical Journal, a mode of producing photographic prints, by applying to paper a mixture of bi-chromate of potass and sulphate of indigo. In this process the bi-chromate, the coloring matter, and the organic matter of the paper, are the three materials on the reactions among which, under the influence of light, the principle of printing in carbon or pigments depends. The prints produced by Mr. Mungo Ponton appear to have been the first permanently-fixed photographs, and we may consider that gentleman as the discoverer of Photography, for the Talbotype and Daguerreotype processes were not published until the following year, 1839.

The next step, if it can be called a step, in this direction was taken by M. Poitevin, who patented in England, in the year 1855, a process of Photo-Lithography and Printing in Pigments: that clause of his Specification which relates to the latter process, being as follows :—

"I apply various liquid and solid colors upon paper, cloth, glass, and other surfaces, by mixing such colors with the aforesaid mixture of a chromate or bi-chromate with organic matter, and applying this new mixture or combination to the paper or other fabric or surface.

"The photographic impression is produced upon this prepared surface by the action of light passing through a negative photographic picture, or an engraving, or other suitable object, or screen, or in the camera-obscura, and it is then washed with a sponge and a large quantity of water. The albumen or other organic matter is rendered insoluble at the parts where it has been acted upon by the light, and the design is thus produced in the color which has been employed. Mixtures containing different colors may be applied to different parts of the surface, corresponding to different parts of the negative or screen employed to produce the photographic impression. A design in several colors may thus be produced. The proportions of the materials may be varied."

The organic matters which M. Poitevin has alluded to, are mentioned in the former part of his Specification, and are "albumen, fibrine, gum arabic, gelatine, or similar organic substances." The materials used by Mr. Pouncy, viz., bi-chromate of potass, gum arabic, and carbon, or solid color, are therefore included vaguely in M. Poitevin's Specification, and the mode of removing the unaltered chemicals by washing the paper in water is also indicated. But we have never heard of any prints produced by M. Poitevin having been exhibited, nor do we think his patent would hold good after what had been published by Mr. Mungo Ponton, in 1838.

The next step in this direction was that taken by M. Testud de Beauregard, who, in December, 1857, provisionally registered a secret process for some "Improvements in Photography," the Specification of which was made public in May of the present year, and published in No. 54 of this Journal. M. T. de Beauregard applies a mixture of bi-chromate of potass and gelatine to a sheet of paper, and when dry applies the carbon,—denying at the same time the possibility of producing a print by applying the mixture of bi-chromate, carbon, and gelatine, directly to the paper.

The next step was taken by ourselves, without any knowledge of what M. Beauregard had done a fortnight previously. In No. 42 of this Journal, that is in the number for January 1st of the present year, at p. 7, we make the following remarks :—

"Some experiments in which we were engaged a few weeks ago, lead us to believe in the possibility of Printing in Carbon, by the following process :—

"First,—Dip a sheet of blotting-paper in a mixture of bi-chromate of potass, albumen, and finely-ground charcoal; or blacken it (in the dark), with Indian ink, ground up with a solution of bi-chromate and gelatine, or albumen.

"Next,—Dry the blackened paper, and expose it to light, under a negative.

"Lastly,—Immerse it in water, which will more or less perfectly remove the black material from those parts where light has *not* acted, without disturbing those parts where light has acted, and thereby rendered it insoluble. In this way a print in black, and a sort of dirty white, may be produced. After which it is probable that immersion in an alkaline solution may clear up the lights sufficiently. This was the direction in which we were experimenting a few weeks ago, when some matters interfered to prevent our carrying the experiments any further."

The use of blotting paper was wrong, but we are convinced that with vegetable carbon, and either albumen and gelatine, good prints might be obtained.

Now comes the part which Mr. Pouncy has played in this matter. In the month of March of the present year, that is, about two months after he had seen the foregoing remarks in this Journal, (to which he has been a subscriber from the first), he enclosed us some carbon prints, in which the whites were clean and the blacks black; and on the 10th of April he patented the process provisionally, according to the Specification published in the present number. Since that time he has greatly improved in his manipulation, but has allowed the patent to go uncompleted. To us it appears that Mr. Pouncy was the first to produce a presentable carbon print, and that to him belongs the credit, and a very great credit it

is, of having practically worked out a process which was merely suggested by others, and brought it to about the same perfection as any other photographic process. So far then as the discovery of Carbon-Printing is concerned we should consider Mr. Mungo Ponton the discoverer of the principle, and Mr. Pouncy the discoverer of the best mode of carrying it out; at the same time we entertain a high appreciation of what M. Poitevin has done in Photo-Lithography, and also of the many ingenious experimental investigations of M. T. de Beauregard, but with all due deference to these gentlemen, we require to *see* their productions in direct Carbon-Printing, or to hear of some one who has, before we can give to the patentee of what appears to have been little more than an idea, the glory which by right belongs to the man who has, after many months of indefatigable toil, produced fine results.

So much for Carbon-Printing, a process which was suggested before the discovery of the present methods of Photography, and which has been taken up and perfected during the present year. Hitherto all the productions of photographers have been more or less perishable. Daguerreotypes fade if not properly washed; collodion positives and negatives fade if not properly washed and varnished; developed prints upon iodide and chloride of silver fade if not properly washed; untoned sun-prints upon chloride of silver fade if not properly washed; toned sun-prints upon chloride of silver frequently fade when they *are* properly washed;—but in Carbon-Printing the case is reversed, for those parts which are not properly washed become permanent, and the difficulty in this process, if it can be said to have a difficulty, is to prevent parts of the picture from becoming too permanent; at the same time, if a thing which is already permanent could be supposed to become more permanent, the exposure of a carbon print to light fixes it more indelibly to the paper. Another important feature in Carbon-Printing is the absolute purity of the whites; and it is a remarkable thing that a sheet of paper which has once been blackened all over should by mere washing in water entirely regain its original whiteness without a trace of discoloration,—but so it is. It is also a remarkable and important fact, but one which is consistent with all that we know of direct sun-printing, that the amount of carbon fixed by the insolated bi-chromate and gum should be in exact proportion to the amount of insolation, so that all the half-tones of the picture are faithfully rendered. With respect to definition, that must depend, in any photographic process, upon the smoothness of the tablet, and if Carbon-Printing could be applied to opal glass or porcelain, nothing would be left to desire on this point. Taking then all these things into consideration we are inclined to think Carbon-Printing a very important step in photography, and one which is capable of many useful applications and which may open new branches of industry. To us it does not seem likely that any method of photographic engraving, or etching, or Photo-Lithography, will ever achieve the same delicacy of detail and modulation of tone as Carbon-Printing, for the mechanical operations of pulling a proof in printer's ink can hardly yield so perfect an impression, even supposing the plate more perfect than it is ever likely to be, as the direct action of light in Carbon-Printing. But all these processes are interesting, and who can tell to what the progress of discovery may lead? Let us hear what the Americans have to say on these subjects:—

Mr. Snelling's American Photographic and Fine Art Journal for August last is illustrated with an exceedingly fine Photo-Lithographic copy of an engraving, by Messrs. Cutting, Bradford and Turner, Boston, U.S., and contains an article on Photo-Lithography, from which we make the following extract:—

"Among the many processes which have claimed the attention of the searchers after hidden things, that of *Photo-Lithography* was among the first. In fact, it was quite simultaneous with the publication of the Daguerreotype, by MM. Niepce and Daguerre, the most successful attempt having been made in 1839 by an Italian nobleman, (whose name has escaped us), who succeeded, by the aid of a telescope, in impressing the nebulæ of Orion upon a lithographic stone, and taking pretty fair specimens from it with lithographic ink.

"So far as we are enabled to learn, the next attempt at all worthy of our consideration, was made by Joseph Dixon, Esq., who, in 1840, made several experiments in this direction, and succeeded partially in solving the problem; but it is reasonable to suppose, from his having abandoned his researches, that he failed to come to any satisfactory practical result.

"Several French and German *savans* essayed to elaborate this process and apply it to illustrative art, but up to the present time their endeavours have met with slight reward; we hear of nothing having been done to render it worthy the notice of publishers, or those who take an interest in the progress of Art matters. With so many of the first minds of Europe engaged in the study of this branch of photography, and delving deeply into the hidden recesses of nature with the purpose of tranferring the exquisite limnings of the sun to stone, copper and steel, in aid of their multiplication, it is—and should be—a source of great pride to us, that it was left to the *American mind* to attain that perfection in *Photo-Lithography*, which alone can make it of practical utility.

"It was left to Messrs. CUTTING, BRADFORD and TURNER, of Boston, to perfect this art, and that they have done so in a masterly manner is shown by the results before us.

"For these improvements Messrs. Cutting and Bradford obtained a patent, and although in photography proper we have invariably set our face against patents, (and were we to-day to discover one of the most important improvements that could be made in it, we should not take out a patent); yet if we never felt disposed to have a hand in patents before, the results of Messrs. CUTTING, BRADFORD and TURNER'S *Photo-Lithography*, which the latter gentleman has shown us, have given us a very strong inclination to bid for an investment.

"We have seen many specimens of European *Photo-Lithography*, and of European and American Lithography, and we venture to say, without fear of contradiction from any who have the opportunity to compare the results, that in any point of view, natural or artistic, elaborate finish or detail, or in striking effects, nothing can be superior, in the present state of the art, to prints produced by Messrs. CUTTING, BRADFORD and TURNER. We have been shown prints of every description,—microscopical objects, magnified thousands of times, portraits from life, copies of drawings and engravings, views of manufactured articles, landscapes, fossil remains, &c., &c.; all possessing delicacy and minutiæ of detail, which we say, without hesitation, cannot be approached by the eye and hand of the best artist.

"As a partial—and it is only a partial indication of what is to be accomplished—evidence of the truth of our opinions, we give our readers, in the present number, a copy of an engraved head. It will be seen that every line is accurately copied, and that the print takes materially of the nature of the engraving from which it is taken. The grain of the stone, as shown in this, is admirably overcome in many of the other specimens shown us. In fact the process is capable of entirely obliterating all trace of lithographic grain, and giving the picture the appearance of a fine mezzotint engraving, or of a first class photograph.

"In the illustration of every description of books, this process *must supersede* the present lithograph, and to the naturalist and physiologist it is invaluable. In copying insects, animals, fish, fowls, mineralogical specimens, trees, and all kinds of vegetable productions, not a speciality is lost, for, as with the photograph, what the eye alone cannot see is revealed upon the application of the magnifying glass.

"Another point to be conisdered in this Photo-Lithographic process is, not only its general application to illustrative art, but its adaptation to the wants of a large class of artists who usually wish to multiply their drawings and paintings at a nominal cost. All they require is the process, the photographic material, and the stone—any lithographic printer can strike off the desired number.

"Our readers, by comparing the picture in the present number with those given in April and May, will at once note the rapid strides the patentees have made in improving their process, and we feel convinced we shall be able to give, in future issues, pictures that will indicate this improvement in a more marked degree. There is no *American* improvement in art that has given us so much pleasure and satisfaction as this, and we do not regret that it has fallen to our lot to congratulate a gentleman whom we have heretofore been—reluctantly—obliged to oppose. This subject admits of still further observation, and we shall again refer to it."

We also extract the following remarks from the last number of Mr. Seely's American Journal. They occur in an article by Mr. Seely, headed, "Carbon Photographs,—Photo-Engraving, &c." :—

"As to Carbon-Printing, I have little doubt that Photo-Lithography will prove the best process where many copies are needed,—the best in view of economy and rapidity. The preparation of the stone requires little labour and but a few minutes, when it is ready for printing, in every respect, by the ordinary lithographic press. Photo-lithographs can be produced cheaper than other lithographs, for the reason that the photographic impression on stone is easier made than a drawing in the usual way (an important item) while all other expenses are precisely the same. As to the permanency of Photo-Lithography nothing need be said; and any who have examined the best work done by Cutting, Bradford and Turner, of Boston, and Isaac Rehn, of Philadelphia, are satisfied that the Photo-Lithographs are not far behind the photograph in truthfulness. I have seen no carbon impressions produced in any other way that can be considered superior as pictures.

"On page 32, bi-chromate of potash, &c., are alluded to as materials for producing carbon prints. I commenced experiments with those substances eagerly. The theory of the process, and the manipulations seemed palpable and easy. But my ardour cooled on learning from the "Bulletin" that M. Poitevin had anticipated me by several years—had not only made photographs in carbon but a variety of pigments by the same plan.

[These remarks in the Bulletin were simply extracts from *Photographic Notes*.—ED. P. N.]

"The method I find quite easy is as follows :—I make a solution of gum arabic in water about as thick as molasses. With this I grind on a glass or in a mortar a sufficient quantity of calcined lamp-black, ivory black, or other pigment. When the mixture is thorough, I add in the dark an equal part by measure of a saturated solution of bi-chromate of potash in honey, diluted with an equal part of water. The whole is now to be carefully mixed by stirring or grinding. This intimate mixture is a point of the greatest consequence. The paper I prefer is the highly albumenized. The mixture is laid on by floating, or with a large flat brush. Dry in the dark. The printing is performed in the usual way, only using about half the time for ammonia-nitrate paper. After exposure the print is soaked ten minutes or more in water, and then exposed under a stream of water till the whites are fully brought out.

[Mr. Seely has pretty nearly hit upon Mr. Pouncy's process.—ED. P. N.]

"Any one on reflection will perceive that the above process cannot produce a picture so perfect in detail and delicate shading as the ordinary silver prints. The only recommendation I can give it is the permanency of the results, and its simplicity and economy. Although better pictures have been produced here than the specimens of Mr. Pouncy's work sent by Mr. Sutton to America, they are as yet slightly inferior to the best Photo-Lithographs. Assuming that they may be made of the same quality, it appears to me that Photo-Lithography will be found advisable when fifty or more prints are required.

"The changes I have made in the process as published are: the use of honey, to facilitate the washing development, and the albumenized paper.

"I have attempted, on a totally different theory, to produce carbon prints, and although I have not had much success, I have not lost confidence in the principle. It is well-known that a mixture of chlorine and hydrogen is extremely sensitive to light, combining speedily and only in the light. If carbide of hydrogen is substituted for the hydrogen, the carbon is precipitated on exposure to the light. Saturate a sheet of paper with camphine (a carbide of hydrogen) and expose it to the camera image in an atmosphere of chlorine, and the image will be fixed; or expose the camphine paper to the vapors of chlorine or bromine—and then to the image, or under a negative. Such a procedure thus stated is evidently impracticable, yet I have little doubt that it may prove the germ of something valuable.

"Photo-Engraving.—For the following process I am indebted to Mr. Joseph Dixon, of Jersey City, by whose courtesy I am permitted to give it to the public. I have had no opportunity to test its value by trial, but I am assured by Mr. Dixon that it is capable of very good results:—'The process is founded on the fact that if a polished steel plate be rusted in spots, printer's ink will adhere only to the rust, from which it may be printed in the ordinary way. Expose a paper or collodion photograph to the vapour of iodine. The iodine is absorbed only where the impression exists. The photograph is now pressed in close contact with a steel plate, prepared as for engrossing. The iodine partly leaves the photograph and rusts the steel correspondingly. The time required for rusting properly may be days. The applying the ink and printing are quite similar to the common method of the steel printers, making the necessary variation for the raised surface instead of cavities.'

"A conversation with Mr. Dixon on the above suggested to me a plan which has some advantage. It is commonly known that if an ambrotype be cautiously heated to about 500° the collodion film burns away, leaving the whole of the silver picture undisturbed and adhering to the glass. The plate may now be etched with hydro-fluoric acid, and thus a tolerable printing surface obtained. But I should prefer to transfer the collodion picture to a plate of metal, burn the film, and etch with any acid which will not affect the silver. I found the transferring the film easy enough, but on burning the film the silver did not adhere, owing apparently to a film of oxide formed on the plate. If the metallic plate is first amalgamated the difficulty is mostly overcome, but the sharpness of the etching suffers.

"Both of the above processes require a positively transmitted light."

The above remarks of Mr. Seely's appear to contain some very valuable suggestions.

An improved process of photographic etching has lately been patented by Mr. Fox Talbot, and has been called by him Photoglyphic Engraving. We shall publish his Specification *in extenso* at the earliest opportunity, and in the meantime the following particulars of the process will suffice:—

A steel or copper plate is first cleaned with soda and whiting, than coated with a mixture of gelatine and bi-chromate of potass, and exposed under a negative to light. It is then, without being washed, powdered all over very thickly with finely pulverised copal, which is then melted upon the plate by holding it over a spirit lamp. This forms a sort of aquatint ground. As soon as it becomes cool a solution of per-chloride of iron is applied to the plate with a camel's-hair brush; this attacks the parts which have *not* been acted on by light, and thus the plate is etched; after which the surface is cleaned, and prints pulled from it in printer's ink in the usual way.

This new process differs from the former one patented by Mr. Fox Talbot in 1852 in the following particulars:—viz., in the plate not being washed after exposure to light, in its receiving an aquatint ground, and in the substitution of per-chloride of iron for per-chloride of platinum.

While on these subjects, we may mention that we are endeavouring, with the help of a gentleman who is one of the engravers for the Illustrated London News, to perfect a process of taking photographs upon wood, so that they may be afterwards cut, and we hope shortly to be able to illustrate a number of this Journal with a picture produced in this way.

Can any of our readers kindly reply to the following query from the engraver who cuts the diagrams for this Journal? :—He wishes to know how the ink of a very old print may be transferred to a wood block. If a proof, recently printed, is simply damped, laid upon a wood block, and the back rubbed with a burnisher, the design is transferred to the block, but the plan does not answer with an old print. We have advised to damp the old print with a solution of caustic potass in alcohol. A method of transferring the prints is successfully practised in America. Can any of our American readers favor us with the particulars of this process? We are told that the solution employed turns the paper buff-color.

We have alluded on two or three former occasions to a new combination of lenses invented by a gentleman at Manchester, in which distortion of the image is absolutely corrected, and we mentioned that immediately on hearing of this invention we got Mr. Ross, of Featherstone Buildings, to make for us a combination on the new principle, in order that we might thoroughly try and report upon its merits. This we are now prepared to do, but must observe in the first place that we are not at liberty to lay the *full* particulars of the construction of the instrument before our readers, as the inventor has not yet completed a novelty which he is working out in the mounting of the lenses, and which he imagines will render the instrument much more perfect; so far, however, as the general principle of the arrangement of the lenses is concerned we can sufficiently explain it in a few words.

Let the reader imagine a pair of achromatic convex lenses of any form, but identical in all respects, placed in a tube at any distance apart within a certain limit, with their similar sides opposite, and a diaphram exactly midway between them. Or, in order to fix the ideas, let him suppose the arrangement to consist of a pair of plano-convex achromatic lenses, having their convex sides outwards, and their plane sides inwards and opposite to one another, and a small diaphram midway between them; this combination will then be perfectly symmetrical. Now, let any straight line be drawn through the centre of the diaphram till it meets the inner sides of the lenses, and let it then be continued through the lenses according to the law of the refraction of light. It is evident, from the symmetry of the combination, that the directions of the two lines without the lenses will be accurately parallel; from which it follows that if a ray of light be incident obliquely and eccentrically upon the front lens in such a way as that its course between the lenses may pass exactly through the centre of the diaphram, it will emerge from the back lens in a direction parallel to that at incidence.

Now let us suppose the diaphram infinitely small, that is to say so small that only a single ray can pass through it, and let the combination be presented to the objects of a view. From every luminous point of those objects a pencil of light proceeds which covers the entire front lens, but of that pencil only one particular ray can pass through the diaphram, and that ray will, after passing through the back lens, emerge in a direction parallel to its direction at incidence,—the deviation which it suffers in consequence of refraction through the front lens being exactly counteracted by refraction through the back lens. If, then, we suppose an infinitely faint image produced by these single rays impinging upon a focusing screen that image will be entirely free from distortion,—as much so as the image formed by a pin-hole in the front of a dark camera, in which case, as in that of the combination, the rays suffer no deviation.

All this being understood, it remains to shew that the actual image formed in the photographic camera by this new combination when the diaphram is of small but finite size, and when for single *rays* of light we substitute *pencils* of light passing through the diaphram, is equally free from distortion. To demonstrate this point we shall assume that the image is sharp and distinct upon the focusing screen, and that the astigmatism of the foci is of too small amount to be appreciable by unassisted vision;—or in other words that the "circles of least confusion" of the oblique pencils are of inappreciable diameter. If this be not the case, and if the image be "fuzzy" and indistinct it is hardly a subject for comment or criticism. The object is to show that the apparently sharp image upon the focusing screen of a luminous point not situated upon the axis of the lens is really in the line of the ray which passes through the centre of the diaphram. This is a very simple matter. The focus of a pencil is produced by the concourse of *all* the rays which pass through the diaphram, and since the ray which passes through its centre is one of them, the focus is formed at the point where that particular ray meets the focusing screen. The combination therefore absolutely cures distortion of the image in the ordinary process of working with it, with a small diaphram.

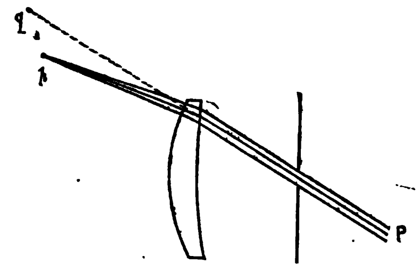
The reasoning does not involve any particular form of the equal and similar lenses, the conditions of the combination may therefore be satisfied in an infinite number of ways, but of the infinity of solutions which it allows one particular solution is the best for remedying spherical aberration and curvature of the image. That best form we imagine to be plano-convex, and the combination which Mr. Ross has made for us consists of two equal plano-convex achromatic lenses, separated by an interval which is capable of variation, and mounted with their plane sides inwards, and a diaphram midway between them. This new combination we have now thoroughly tried, in a variety of ways, and the following are the results obtained:—

With respect to distortion. When the diaphram is placed nearest to the *front* lens, and the image of a perpendicular straight line is brought to the edge of the field, it is curved *inwards* at its extremities. On the contrary, when the diaphram is placed nearest to the *back* lens, the line is curved *outwards* at its extremities. When the diaphram is placed exactly *midway* between the lenses the line is absolutely *straight*. So far therefore the results of theory are strictly borne out in practice.

With respect to spherical aberration and flatness of field. When all the stops are removed the combination gives inferior central definition to an ordinary portrait combination, and the marginal definition is very bad; so that the combination has, on the whole, no other advantages than that of curing distortion. We were not surprised to obtain this result, for we expected to find the new combination inferior to the ordinary portrait lens as regards central definition, and so far as we can judge, it is inferior. Any one who possesses a twin lens stereoscopic portrait camera, will find, on removing the front lens of either combination and mounting it as a back lens to the other combination, with its flat side inwards, that inferior definition is obtained.

With respect to curvature of the image. Neither the new combination, nor the ordinary portrait lens give a flat field. The Petzval view-lens is by far the best in this respect. The new combination is therefore only fit for use with a small diaphram, and then it makes a good view-lens, or a perfect copying lens, rendering the lines of a stereoscopic picture copied by it full size as accurately as if the print had been obtained by superposition. No ordinary lens will do this.

Having thus explained at some length the principle of this combination, it is not too much to say respecting it that it is the most important optical instrument that has yet been made for photographic purposes, for it is an absolute fact that all the photographs which have hitherto been taken with the common lenses are more or less false and distorted representations; while of all optical instruments that can be conceived none is so fearfully bad in the matter of distortion as the view-lens with a stop in front, no matter how it is achromatized,—whether with the crown or flint glass in front. This will be evident from the following diagram, in which the twist which an oblique pencil gets in passing through the margin of the lens is clearly shewn; and it will be remembered that this deviation is not counteracted by any back lens:—



In the common portrait combination the deviation occasioned by the front lens is to a great extent corrected by an opposite deviation produced by the back lens, and there is consequently much less distortion with a portrait lens having a diaphram between the lenses than with a single view lens and diaphram in front. But the diaphram should not be placed exactly midway between the lenses; that has been a mistake; its best position for curing distortion would be at a certain point which may be determined by trial.

The inventor of the combination which we have described, and which is a symmetrical combination, has devised a system which is un-symmetrical, and which nevertheless cures distortion, and gives a flatter field than the other. The particulars of this instrument will be published by him in the course of a few weeks, and when his arrangements are ready for supplying it commercially they will be duly advertised in this Journal. He does not intend to take out a patent, and if, on trial, Mr. Ross finds them answer, he will manufacture them for sale.

In concluding this article we beg of the reader to study it carefully. Photographers may now turn over a new leaf. Hitherto their works have been, without exception, false in outline: in future they may be absolutely true.

Mr. Ross is now making for us a second lens, identical with the first, so that the pair may be fitted to a stereoscopic camera. The focal length of these combinations is only three-and-a-half inches, and yet with a small diaphram they cover a field three-and-a-half inches in diameter, with an image sharp in every part and absolutely free from distortion. Mr. Cox, of Skinner Street, has lately made for us a beautiful instrument for copying stereoscopic negatives by means of the above lenses. It answers to perfection, so far as we have tried it in copying a single picture, and will of course answer equally well for the pair when the other lens arrives. When we have become perfectly familiar with the use of this instrument we shall devote a long article to the subject of copying transparent stereoscopies by wet collodion. In the mean-

time it may be important to observe that ordinary negatives will not do, as they are much too dense. The negative should be full of detail and half-tone, and in density something between a positive and a negative. Our new combination, with a three-quarter-inch diaphram between the lenses, yields a perfectly sharp image the same size as the original, an exposure of one or two seconds to light from the Northern sky transmitted through the negative being sufficient; but it is more convenient to use a much smaller diaphram. The copying box is a camera having two sliding bodies, one of which carries the negative, the other the dark slide. Its entire length is about eighteen inches. It has a partition in the middle which carries the lenses, and another partition longitudinally in the middle down its entire length. One lens copies one picture while the other lens copies the other. But more about this matter on a future occasion.

We have received from Messrs. Matthews, of Charing Cross, a pair of India-rubber gauntlets, for photographic purposes. They answer admirably for making gun-cotton; in fact we could not possibly get on without them; but for ordinary photographic operations they are not quite so good, being a little too rigid; however, Messrs. Matthews are about to manufacture a rather lighter kind of glove, at 5s. per pair, for ordinary purposes. Every photographer should procure a pair of these gloves, and if he does not attend to this matter himself, we advise his lady friends by all means to see to it.

We copy the following formula for a black varnish from an American Journal:—

"Dissolve as much bees'-wax in turpentine as it will take up, and mix this with the asphaltum varnish, in the proportion of three parts of the latter to one of the former. This varnish will not crack, no matter how thick or thin it is put on."

"Another very excellent black coating can be made by thinning the 'Excelsior Company's printer's ink' to the required consistency with turpentine."

In No. 52 of this Journal we recommended printer's ink as a backing for glass positives. Our present impression is that there is nothing better for that purpose. The mode of using it is first to thin it to the proper consistency with printer's varnish, (which is a compound of boiled oil, resin, and yellow soap), then rub it over the back of the plate, and also over a piece of paper; press the two into contact, and put the positive at once into the case. The ink loses none of its brilliancy on drying, and it never cracks.

When it is required to remove the black asphaltum varnish from a varnished collodion film, this may be done either by means of benzole or chloroform, without injury to the picture, as both these liquids are solvents of asphaltum and India-rubber.

We have received from Herr Pretsch the copy of a paper read by him at the last Meeting of the Blackheath Photographic Society, but since the former part of this paper has been already inserted in the Journal of the Photographic Society, which no doubt many of our readers see, we have declined inserting it, as space is always valuable, and novelty preferable to reprints.

We have heard with great regret of the death of Mr. Horne, of the firm of Messrs. Horne and Thornthwaite. This gentleman was liked and respected by all who had transactions with him. He was an exceedingly clever practical photographer in every branch of the art, but more particularly as a Calotypist; and from many who knew him intimately we have heard that there was not a "nicer fellow."

We cannot forbear mentioning it as a remarkable fact that among the hundreds of persons with whom we have had, during the last three or four years, business relations connected with photography, very few have, to our knowledge, been removed by death.

We have received from Mr. George Wilson, of No. 24, Crown Street, Aberdeen, the well-known photographer, a series of the most charming stereoscopic views upon paper that we have yet seen. In many of these photographs Mr. Wilson has succeeded in introducing the natural sky, the instantaneous ripple upon the surface of water, animated figures, and at the same time rendering all the details of the objects in shadow. This has not been done by any trick in the printing, nor have the negatives been retouched; the result is due to legitimate photography. Among the most remarkable of the subjects sent are the following:—Oban, Sunset;—a Summer Morning on the Sands;—Fishing Boats on Loch Fine, at Inverary;—Oban, Evening;—Inverary, Argyleshire; and the instantaneous portrait of a Child, seated upon a rocking-horse, and with a merry smile upon his countenance. These subjects are so exceedingly fine, and so far in advance of what one usually sees, that they require especial notice.

"Oban, Sunset."—In this view the artist has pointed his camera directly at the sun's disc. The sun is just about to disappear behind a heavy bank of clouds, the edges of which are tipped with light. These rest upon a long range of distant hills, between which and the foreground is a broad sheet of water covered with ripples. On this water, immediately beneath the sun, is a bar of dancing light, not snowy, but just one shade lighter than the rest of the water; a steamer is crossing it and leaving behind her two long lines of wake from the rudder and paddles. The foreground

consists of a row of housetops with quite enough of detail in the shadows. This picture, although evidently taken instantaneously, is sharp all over, and the manipulation clean and even. No diffused light has entered the camera, for Mr. Wilson informs us that the tubes of his lenses are lined with black velvet, the edges of the lenses blackened, and a shade in front also lined with black velvet. Such an instrument is not to be purchased ready made, and the reader will observe that the first professional photographers, who aim at something beyond the imperfect things that have been done in the infancy of the art, and in their daring attempts venture even to point the camera at the sun himself, are compelled to modify entirely the mounting of their lenses, and the plan of their camera. The cameras and lenses commonly made and sold are unfit for anything beyond the most elementary applications of the art, and indeed scarcely fit for them. We beg of the reader to note these things. The photographic lens and camera commonly sold by opticians are very incomplete, and the cause of innumerable failures, which are erroneously attributed to the chemicals being out of order.

One remarkable feature of this picture is the halo round the sun. This we are informed was produced by some defect in the lenses. We saw a negative the other day in which every pane of a window had a dense black spot in the middle surrounded with a luminous ring, about a quarter-of-an-inch in diameter, from the sun's image having been reflected by the glass into the camera. These rings were probably produced by light which had suffered internal reflection from the inner spherical surface of the front lens.

"Oban, Evening."—This subject is similar to the last in composition, but the sun was too high to be included in the picture, and a steamer, with smoke rising from the funnel, lies directly across a broad bar of reflected sunshine upon the water. The ripple is sharply indicated, the distance well thrown back into haze, and the foreground fully out in all its details.

"Inverary, Argyleshire," is another marvellous subject, in which clouds, reflections in water, animated figures, and detail in the shadows, are all rendered in perfect truthfulness to nature. There are no chalky whites, nor black unmeaning patches of shadow.

"Fishing Boats on Loch Fine."—In this picture figures are introduced, and the shadows of objects are thrown *towards* the spectator.

"A Summer Morning on the Sands" combines clouds, ships, breaking waves, and a wet beach. It is a delicious little photograph.

In addition to the above subjects we received several very fine ones of less pretensions to novelty, but equal in their way to anything that has been done in photography. The best are perhaps Fingal's Cave, Staffa, three subjects; Bonnington Falls on the Clyde; Waterfall at Inversnaid; and and Loch Etive, a subject which has extraordinary merit as a composition.

It is needless to say that such subjects as these could not possibly have been produced by the pyro-gallic development. We are informed by Mr. Wilson that they were all developed with iron.

IS VISION A PHOTOGRAPHIC PROCESS?

The following is an extract from a letter from a distinguished professional photographer, with whose permission we insert it under an anonymous signature:—

"You remember the story of the photograph of a man being discovered on the retina of an ox's eye, the said photograph being a portrait of the man who had slain him, the action of the chemicals in the ox's eye having been suddenly arrested by the stroke which killed him. Well, I have been assured that the story is all humbug; but I am not satisfied, because there are still several things in the phenomena of vision that cannot well be explained without supposing the story to be all true. For instance, if you touch any hard object with your finger, the nerves of that finger convey the sensation of touch to the mind instantaneously, but if the eye is suddenly directed to any object, although the image of this object is instantly thrown by the lenses of the eye upon the retina, it takes a quite perceptible portion of a second for the optic nerve to convey the sensation of the image to the mind.

"When you look steadily at a brilliant red setting sun for a few seconds and then shut your eyes or look in an opposite direction, you still see the image of the sun, but of a greenish color instead of red, and if there should happen to be any bright golden clouds near the sun their images will still be quite perceptible on shutting the eyes, but instead of golden yellow they will then appear purple. If you look steadily at the sun for a couple of seconds, and then let your eyes wander over the neighbouring clouds for a few seconds, you will find, on shutting your eyes, that several images of the sun have been impressed upon the retina.

"Now may it not be quite possible that the images which the lenses of the eye throw upon the retina are actual photographs after all, and thus these images of the sun are so intensely solarized, so to speak, as to require a longer time than usual to obliterate them. Of course they are not black and white photographs, they have all the glory that color can give them; and when we have copied our achromatic lenses from the construction of the eye, and lately made a self-contracting diaphram in imitation of the iris, may it not be possible, by a still more careful study of the eye in a chemical point of view, to make the crowning glorious discovery of photography in colors! What I particularly wish to know is this, has any competent person made any careful experiments or tested the fluids of the eye chemically, so as to be qualified to give a flat denial to the 'ox-eyed' story?

"When we weep, we know that the '*salt, salt* tears do flow', and the black pigment looks as if it contained *iodine;* and there may be more things in it than have yet been dreamed of.

"When a Daguerreotype plate is made sensitive by holding it above iodine and bromine, and exposed in a camera to the image of some object until it has been sufficiently acted upon, this image may be developed by holding the plate above the fumes of mercury, but if, after it has been exposed in the camera, and before it has been developed, it is taken into the dark room and held for a second or

less above the fumes of bromine again, the latent image that was upon the plate is obliterated and its surface is ready to receive a new impression. We can believe from this that it is quite possible to obliterate an image from the retina of the eye and have the surface ready sensitized in a small fraction of a second.

Again, would not this theory throw some light upon Daltonism or color-blindness? You cannot fancy a lens giving perfect definition as to *form* upon the ground glass of a camera, and at the same time transposing the reds into greens, and the yellows into purples; but from some disarrangement in the proportions of the chemicals you can easily conceive how a photograph might be so changed. If it is a fact therefore, that every time we direct our eyes at an object, that object is photographed in colors on the retina. Color blindness is merely some derangement in the proportions of the fluids used in obtaining such photographs.

If I mistake not, the people who are afflicted with color-blindness, do know greens from reds, and yellows from purples, when they see them; but they do not see them, if, through some derangement of a local nature, the greens are transformed into reds upon the retina of their eyes. There are also some things in somnambulism that might be capable of explanation by this theory; such as why a person walking in his sleep does not perceive external objects although his eyes are wide open; and it may be to give time to the chemicals to be concocted or strengthened that we close our eyeballs and shut out external objects when we go to sleep.

"PHOTO-CHROME."

PORCELAIN DISHES.

To the Editor of Photographic Notes.

SIR,—In your last number, a correspondent signing himself "*Simonides*," complains that he has not seen a porcelain bath or dish of English manufacture but the common soft earthenware, glazed over; he also speaks favorably of French porcelain. It is my wish to inform him where he can get English pottery, very far superior to any that was ever made in France, particularly for photographic or chemical purposes. The manufacturers have for years pursued photography as an amusement, and contrived a great many useful articles to assist the Photographer.

"*Simonides*" will find their porcelain flat, square, and extra-glazed, equal to glass itself. I have used their ware for years, and can assure him that if he will try it, he will have no more to do with gutta-percha. I believe all articles now called gutta-percha are economised by mixing earthy matter with the material, and from my experience (which is not short) gutta-percha baths or dishes should only be used when portability is required.

The manufacturers I allude to are Messrs. Mayer and Elliott, Dale Hall Pottery, Burslem.

I have imported French pottery for Photography; it is well glazed, but badly made, being so bent in drying that I have never been able to sell it.

I should not have trespassed upon your pages, but thought it should be pointed out by some one that we have very superior pottery in this country for Photography, and French photographers are glad to get it in place of their own.

Yours, very respectfully,

JOHN ATKINSON.

37, Manchester-st., Liverpool, Oct. 23.

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR, UNDERTAKEN DURING THE YEARS 1856-7.

BY J. W. G. GUTCH, M.R.C.S.L.

[*Concluded from No.* 60.]

For the guidance of those in search of photographic subjects, I would subjoin the following abstract of places, which I visited with profit during the years 1856-7, and from experience can confidently recommend them to their notice, feeling assured that they will reap an abundant harvest if they labour diligently:—

Bristol.—Replete with various *old* bits of architecture, fast being swept away by the *improving* generation.

Clifton.—Unrivalled beauty of scenery.

Cheddar.

Wells.—Many days may be spent here, and there is no difficulty of obtaining access to the Bishop's garden, from which place the best view is obtainable of the fine old Cathedral.

Glastonbury.—The beautiful remains of the Abbey.

Nestor.—A few nice bits. Woodspring Priory and Uphill old Church, with its Saxon porch.

Taunton.—Its fine Church, now being pulled down, at least the tower.

Lynton and Lynmouth.—See my description in the first portion of my Jottings, and on the road to it.

Minehead and Porlock.—Bits of shipping and coast scenery.

Ilfracombe.—Coast scenery, rocky and fine.

Exeter.—Its Cathedral.

Exmouth.—Powderham Castle.

Dawlish.—Many pretty Coast views.

Teignmouth and Torquay.

Ictness and Berry Pomeroy Castle.

Dartmouth.—The sail on the *Dart*, to Dartmouth, full of beautiful architectural subjects, and quite enough for a week's work.

Sidmouth and Ottery St. Mary.

Badley, Salterton, and Weymouth.—Portland is the only point of interest here and its new Breakwater.

ABSTRACT OF PLACES VISITED IN 1857.

Edinburgh.—Very much to be done here, though difficulties will be met with, the lower classes being very troublesome if a view be attempted in any public place, the aid of a policeman being indispensable.

Llanlithgow Palace.—Quite worth the run by railway.

Stirling and the Bridge of Allan.—Much to take.

Callendar.—The Pass of Lene. The Trosachs and Loch Catherine, and Loch Lanard.

The Abbotsford Tour. — Melrose, Abbotsford, Dryburgh, Kelso and Jedburgh. A good week's work, and all well worth visiting.

St. Andrew's.—Quite worth a visit, and much to be done.

Dunfermline.—A fine old ruin, and well worthy a visit.

Perth.—The Palace of Saone, and much very beautiful scenery.

Dunkeld.—A week's work may easily be provided here.

Blair Athol.—A day will suffice, unless Glen Tilt will tempt a longer excursion; and on the road from Dunkeld to Blair there is the Pass of Killicrankie, and some very pretty Waterfalls.

Taymouth.—Two day's work.

Killin.—Two day's work. The Falls very fine, and the Rapids in the Trauling river,—all good subjects.

THE LAKES OF CUMBERLAND AND WESTMORELAND.

Bonness and Lake Windermere.—Plenty of subjects are here to be found. Uray Castle, Ferry-side, Newly Bridge, and within easy reach, Furness Abbey, where there is a week's work.

Coniston.—A day's work.

Ambleside.—Some very pretty Falls.

Rydal Water and Grasmere.—Plenty of very good subjects.

Keswick.—Here and around, a month may easily be filled up, taking in the various surrounding Lakes: Borrowdale, Buttermere, Ulswater, &c., &c.

NORTH WALES.

Llandudno.—Some exceedingly good subjects, the Great and Little Orme's Head; good geological studies.

Conway Castle.—A good day's work.

Bangor.—Making this head-quarters for a week, much may be done. The Menai Straits, Beaumaris, Penrhyn Slate Quarries, Carnarvon, &c., &c. I found I was unable in a month to accomplish all I had marked out.

This, then, concludes the Jottings for 1857. Those of the present season shall follow, if you so please, and as the work has now commenced, the first page of Notes taken is already filled, and in due time will be forwarded to you. Two alterations in my mode of proceeding this year have been productive of the very best results, and I therefore will just mention them *en passant.* First,—The use of Ponting's (of Bristol) collodion, which will keep, mixed, for any time, and is the quickest I have ever used. It is very tough and tenacious, and gives very beautiful half-tones; what more can be required I know not; it fulfils everything that can be needed. Secondly,—I have abandoned glacial acetic acid in developing, and now use citric instead. It is much cheaper,—can be carried with the pyro-gallic, ready weighed in packets, and gives very beautiful pictures. One more hint, and I shall finish this long story. I find that by the addition of a few drops of acetate of soda to the nitrate bath that I am able to obtain any degree of intensity, even to the production of a negative too intense to print from. I use 15 drops to 20 ozs. of nitrate bath. I have now commenced my *third* year's experience of Archer's camera, and am now more convinced of its usefulness than I ever was.

On Monday and Tuesday last I was at Wells and Glastonbury, and brought back with me thirty good negatives, which I knew were good before they left the camera,—a source of satisfaction unknown to many who labour, and labour in vain, and in the course of the year have to experience much vexation and disappointment, which can all very easily be avoided.

Subscription List

FOR THE PURCHASE OF MR. POUNCY'S PROCESS OF PRINTING IN CARBON AND PIGMENTS.

	£	s.	d.
Total from former List	21	19	0
His Royal Highness, the Prince Consort	10	0	0
Dr. Becker, Balmoral	1	0	0
R. Taylor, 89, High-street, Chatham	0	5	0
W. B. Harwood, Chiddingford	0	2	6
Dr. Hill Norris, Birmingham	0	10	6
C. G. Veiffel, Goldberg, Mecklenburgh	1	0	0
H. Brunton, 127, George-street, Limerick	0	10	0
John Aitchison, Grange-road, Edinburgh	0	5	0
W. Hooper, 36, Dorset-street, Hulme, Manchester	0	10	0
A Friend of ditto	0	5	0
John Rookledge, Easingwold	0	10	6
G. Robbins, Huntingdon	0	5	0
J. Brown, 69, Blenheim-street, Newcastle.	0	7	6
T. Gulliver, Swansea	0	5	0
P. A. Rayner, Spont-street, Leek	0	2	6
H. Malden, Windlesham House, Brighton	0	10	0
G. Bird, Tollerton	1	1	0
R. Starkie, 4, Strand, London	0	5	0
Rev. G. G. P. Glossop, Isleworth	2	0	0
W. Day, 105, Bishopgate-st., and Friend	0	5	0
J. Mawson, 13, Mosley-street, Newcastle	0	10	0
J. J. Pyne, 63, Piccadilly, Manchester	0	10	0
H. Doubleday, Epping	0	10	6
J. Lugg, East Reach, Taunton	0	2	0
Dr. Canty, Liverpool	0	5	0
W. H. Franklin, Deal	0	5	0
H. Haden, Grant's-buildgs., Birmingham	0	10	0
E. Marr, jun., Battle, Sussex	0	10	0
J. Coupland, Dumfries	0	5	0
A. Clive, do.	0	5	0
W. Bryant, Soap Works, Plymouth	0	5	0
G. Pearson, Kirkby, Lonsdale	0	10	0
G. H. L.	0	5	0
L. Hughes, 3, Taylor-street, Liverpool	0	10	0
G. Andrews, Durham	0	5	0
Dr. Kelsall, Leicester	0	5	0
B. S. Hunt, 14, Trafalgar-ter., Greenwich	0	5	0
— Sprawson, Birmingham	0	5	0
J. E. Matthew, York Villa, Arsenal-road	0	2	6
W. N. Baxter, Northallerton	0	5	0
F. C. Earl, 46, Broad-street, Worcester	0	5	0
J. Strongfellow, Chard	0	2	6
— Lander, 1, Blackstock-lane, Highbury	0	5	0
R. Larkin, do.	0	2	6
Robinson Elliott, South Shields	1	0	0
W. J. Brougham, Burslem	0	5	0
G. Elliott, do.	0	5	0
F. R. Ryler, do.	0	5	0

	£	s.	d.
J. Brown, Raglan-street, Coventry.. ..	0	5	0
J. Dempsey, 30, Upper Arcade, Bristol..	0	5	0
Rev. T. D. Cox, Kingcote, Lutterworth..	0	2	6
J. Armstrong, 27, Lynn-st., Caledonian-rd.	0	2	0
G. I. Hay, 14, The Grove, Hammersmith	0	5	0
F. M. Young, War Office, London.. ..	0	5	0
T. Mercer, 32, Queen-street, Gt. Harwood	0	2	6
T. Birchall, Ribbleton Hall, Preston ..	2	0	0
Belfield Lefevre, Uplands, Exeter	0	10	0
— Wheeler, Manchester	0	5	0
A. De Latour, 28, David-pl., St. Helier's	0	5	0
Barnard Lee, 48, New street, do.	0	5	0
P. Asplet, Halkett-place, do.	1	0	0
Dr. Maidstone Smith, Exmouth	0	5	0
H. Snelling New York	5	0	0
J. Rothwell, 15, Burgess-st., Harpurhey.	0	5	0
G. C. Warren, Newcastle-on-Tyne.. ..	0	5	0
R. L. Jones, Chester	0	5	0
Lieut.-Col. Tisbury, Maulmain, Burmah.	0	10	0
Total to October 27th	£62	10	6

The following letter from Mr. Pouncy, bearing date Oct. 21st, was only received at the last moment, just as we were going to press. The Carbon print which accompanied it is much more vigorous and artistic than the silver print from the same negative:—

Dear Sir,—I beg to inform your readers that the Specification of my Patent of April 10, which is now before the world, does not include the particulars of my process, nor does it in any way interfere with the relations between me and the subscribers. This is a fact of which you yourself are already aware. I also beg to add, that should the sum subscribed reach £100, I shall be most happy to throw my process open through the medium of your *Notes*, regarding that sum in the light of an acknowledgement, not an equivalent. I herewith forward you a Carbon and Silver portrait, both from the same negative, which I think shows that the process continues to improve. Thanking you for the interest you manifest in my process.

I am, dear Sir,

Yours, very truly,

John Pouncy.

Dorchester, Oct. 27th., 1858.

—We sincerely hope that the Subscription List will be completed so that we may be enabled to publish the full particulars of the process in the next Number. [Ed. P. N.]

REMEDY FOR A FOGGY NITRATE BATH.

(Extract from Humphrey's Journal.)

Since the publication of my article, entitled "Remedy for a Foggy Nitrate Bath," at page 3, vol. X. of Humphrey's Journal, I see that Mr. Seely, of New York, has published another, and far different remedy. Mr. Seely says:—

"The new remedy I propose is the exposure of the nitrate bath solution, in a colorless glass bottle, to the sunlight. The first trial of this method was made about four months since, and with such success, that I recommended it to correspondents and others, in cases when acid would not be immediately effectual. In all cases the trial has been satisfactory. When every other remedy failed, this has succeeded. The theory is evident. By the action of light, the nitrate of silver precipitates and destroys the injurious organic matter. When the operation is complete, the solution is perfectly colorless, and devoid of smell. The time required for the exposure would evidently depend on the condition of the bath and intensity of the light. Probably one week would be sufficient for any case that might happen. If the impure bath is already acid, it should be neutralized by carbonate of soda or potash, before the exposure."

Although I had not conceived the idea of exposing the nitrate bath to the sunlight, I had for some time past practised placing the bottle containing my ammonia-nitrate in sunshine for one or two hours after preparing it. It discolors more or less at first, but when filtered, it comes out clean and free from organic matter. It is not so liable to streak the papers, and does not discolor them so rapidly as in the ordinary way. Try it. I have practised for a long time the plan of keeping my iodizing solutions in the sunlight. I attach a string to the neck of the bottles and hang them in the skylight, where the sunshine rests on them three-fourths of the time. There they hang, month after month, and purify, and I can readily see the good effect of it.

Truly, the sunlight has more glory in it than "we wot of." Let us, then, reiterate the cry: "More light, more light!" If any operator wishes to sell any information contained in this paper I say: "*Let 'em want.*" Any artist that will not take this journal, let his equally stingy neighbour have the privilege of taking a V. out of him occasionally; it is serving him just right. The one that takes the V. is no better off, however, than him that loses. I will wager my last year's hat, that the victimizer will be the next victim.

F. B. Gage.

**** Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ARTIFICIAL LIGHT.

To the Editor of Photographic Notes.

Sir,—Now that the season for out-door Photography is about past, and seeing that Mr. Moule, of Hackney Road, is still advertising his "Photogen" at five guineas, other photographers and myself would have no objection to take one, but we think the price is too high, considering the

small remuneration one gets for portraits now. If Mr. Moule would lower his price to two guineas, I am sure he would sell a dozen for one.

Trusting this will meet the eye of Mr. Moule, as this is a universal want, your insertion of these remarks in the *Notes* will oblige,

Yours respectfully,

"Chemical."

STEREOSCOPY.

To the Editor of Photographic Notes.

Dear Sir,—I have a stereoscopic camera fitted with two quarter-plate combinations of portrait lenses. Well, this does very well for groups or objects near at hand, but for a view, some objects which are at a distance do not appear at all in relief. In order to remedy this, I have had a piece of wood 3-ft. long, 4-ins. wide, and ¾-ins. thick, placed on the camera stand and held in position by the screw that did hold the camera; on this bar of wood the camera slides, and according to the distance of the view, so do I slide the camera nearer each end of the piece of wood. When I take a view I focus one lens and take a picture, then I slide the camera to the other end and take the other. I begin at the left hand end and take right pictures, and *vice versa*. They are then in their proper positions on the glass. This might easily be applied to any quarter-plate camera, but of course they must either have the dark slide altered or take two separate plates.

This seems a very easy way, and if of any use to your readers you are welcome to insert it.

"Little Unknown."

—The plan is quite correct when greater relief is desired than is perceived by natural vision.

[Ed. P. N.]

ALCOHOLIC COLLODION.

Mr. R. O. Job, of Truro, speaks thus favorably of Alcoholic Collodion :—

"You do not speak in terms at all too strong respecting the Alcoholic Collodion. My experiments have already been very satisfactory, and I regard your discovery as a *great boon* to the Photographer. I have for some time used a much larger proportion of alcohol, (·810) than is generally recommended, but many difficulties are overcome by the use of alcohol ·794; and I am of opinion that advantages, not even alluded to in your excellent article, will present themselves after a little time."

DRY COLLODION.

To the Editor of Photographic Notes.

Dear Sir,—I cannot resist offering a few remarks in reply to your correspondents "Amateur" and "R. Haines." My own experience has been, I am glad to say, just the reverse of that of those gentlemen. Without undervaluing Hill Norris's plates, which are excellent, but expensive, I venture to approve of Fothergill's process, as the most convenient for the amateur who prepares his own plates: and as far as my experience goes of the two processes, I prefer the results, given by Fothergill's plates. About their keeping properties I am unable to speak, as I have generally used my plates within a few days.

If "Amateur" will send to Mr. Keene, of Leamington, for a specimen bottle of his collodion, he will receive therewith a paper of instructions in which he will learn all he requires: the only addition I can make to them is, that the plates require rather more washing after albumenizing than is there stated. I use Hockin's collodion myself for all purposes, aud by drying the plates at a fire, I find the tendency to peel after development got rid of.

To quote the words of your correspondent, "I have at last settled down to the (dry) collodion process, and am now beginning to really enjoy photography," as I infinitely prefer carrying a box of dry plates to lugging about a dark tent and all its concomitant nuisances.

In conclusion, I shall be happy to send either to you or Mr. Haines "guarantees" in the shape of prints, if either of you care to see them.

Rev. J. F. Ravenshaw.

Pewsey Rectory, Wiltshire.

PRETENDED NEW DISCOVERIES.

To the Editor of Photographic Notes.

Sir,—The application of bi-chloride, or, to speak more correctly, according to the present chemical nomenclature, chloride of mercury to photography, for the purpose of whitening pictures taken after the collodion process, belongs, unquestionably, as well as the collodion itself, to the late Mr. Scott Archer; but, from a prospectus lately put into my hand, I was induced to spend three shillings in the purchase of an article called "Alabastrine Solution," being led to suppose, from the printed description of its advantages, that it was *verily* a "new discovery," and a preparation *free from Mercury*, since it alluded to the objectionable qualities of the chloride; but a more specious and deceptive prospectus I never read than this celebrated Alabastrine Solution. On analysis (for I did it most carefully) it proves to be nothing but a solution of this *condemned mercurial chloride*, about 16 grains to the ounce, with a few drops of a solution of per-chloride of iron, enough to color.

I therefore leave your readers to judge of the candour and honesty of such a preparation as this being put forward as a wonderful new discovery.

Yours respectfully,

John Horsley, F.C.S.

The Laboratory, Cheltenham,
Oct. 6th, 1858.

"*J.*" The alcoholic collodion is, so far as we can judge at present, suitable for the dry process. We are endeavouring to discover a good collodion which shall require no preservative solution.

[Ed. P. N.]

"*J. W.*" When a 5 per cent. solution of nitrate of silver is spoken of it means 22 grains to the fluid ounce of distilled water. [Ed. P. N.]

"*Subscriber.*" Try a different collodion for transferring; all kinds do not succeed equally well. [Ed. P. N.]

"*L. M.*" See the letter by Mr. Howlett on Micro-Photography, in *Notes*, No. 42. [Ed. P. N.]

"*Y. Z.*" We know of no means of quickening the collodion, except by leaving out all useless rubbish, and iodising with pure neutral nitrate of silver, and develop your negatives with iodide of potassium. Make the bath with pure iron, and if necessary, intensify them, after having fixed them, by re-development with iron and silver. By this plan you may reduce the exposure to the shortest at present known, and produce negatives abounding in beautiful modulation and half-tone, and exquisite definition. This is the best negative process we know of, and the best collodion for the purpose is that which we have called alcoholic. [Ed. P. N.]

"*A.B.C.*" Marine glue is made thus:—Dissolve one part of india-rubber in twelve parts of benzole, and add to the solution twenty parts of powdered shellac, heating the mixture cautiously over a fire. Apply it with a brush to the surfaces to be joined.

The best mixture for blackening the inside of lens tubes is made by grinding lamp black with a solution of shellac in wood naphtha. [Ed. P. N.]

"*Mrs. Collins.*" Filtered rain water will do, if not collected in a leaden tank. [Ed. P. N.]

"*T. Barth, Great Horton.*" In order to take a small portion of a distant landscape very large, the object-glass of a telescope 8 or 10-ft. focal length should be employed, with full aperture. [Ed. P. N.]

ENLARGING SMALL NEGATIVES.

"*F. Scrivener, Bury,*" Small negatives may be enlarged to three or four times their linear dimensions when the prints are to be colored by the artist. The original negative should not be much denser than a positive; in fact a positive would be dense enough. The original negative must first be copied to two or three times its size in a copying camera, by transmitted light from the sky, and the positive thus obtained copied again to two or three times its size. In this way an enlarged negative may be obtained. Mr. Beattie, of Queen's Road, Bristol, employs this plan with great success; and he informs us that the enlarged negative is very perfect. The original small negative should be taken with a lens of long focus placed at a good distance from the sitter, and then the proportions of the figure are not exaggerated; and a great number of persons may be included in a group, and all in equally good focus, and without distortion. The portrait lens is generally used for copying; there should be a stop between the lenses. [Ed. P. N.]

"*X.Y.A.*" We have not had much experience with the Iron tablets for positives. We shall be obliged by communications from those who have. [Ed. P. N.]

☞ *The Communications of W. N. Baxter; Rev. W. Bryans; H. Haines; W. Churton, New York; and Durwin de Haunerch; will receive attention in our next.*

Photographic Notes.

NOVEMBER 15, 1858.

We beg to remind our readers that the Third Annual Exhibition of the Photographic Society of Scotland will be opened about the middle of next month, and to refer them to an advertisement for particulars; — we would also call their attention to the fact that the Birmingham Photographic Society has arranged to hold a Permanent Exhibition of Photographs at Aston Hall, Birmingham, which will be opened shortly.

The reader will find at page 264 of the present number the Specification of Mr. Fox Talbot's new patented process of Photo-Glyphic Engraving, as well as that of the former patent taken out by him in 1852. As this new process is now exciting much attention, and as several leading London journals have spoken of it as one of great promise, it becomes important to consider what are the real capabilities of *any* process of Photographic Engraving, when compared with the now advanced processes of Photo-Lithography and Carbon-Printing.

The most perfect photograph that it is possible to produce by any known process is the Daguerreotype upon a silvered copper plate. Let us then imagine that this can be etched by purely chemical means, and that a plate can be produced in which the sunk parts correspond in depth to the intensity of the shadows of the picture. But first observe that in making this assumption we are also assuming that the means have been discovered of biting into the plate in the direction of its thickness by a solvent which does not at the same time bite into it laterally, and undermine the lights of the picture; which discovery remains yet to be made, and would be one of immense practical value. Well then, if we stride in imagination over a great difficulty, and imagine a perfect photograph, etched by a perfect process, we obtain a plate in which the sunk parts correspond in depth to the shadows of the picture, while the high lights remain intact, so that the plate would exhibit hollows gradually shelving up towards the surface according to the modulation of the shades of the picture. But of what use would such a plate be? We answer, None. Proofs drawn from it would exhibit nothing but blacks and whites, and would be totally deficient in half-tones. Wherever a hollow existed, that hollow would be filled with ink, and would print uniformly black, no matter how it varied in depth, or how exquisitely graduated in depth its shelving sides might be. A Photo-Glyphic Engraving would therefore be useless unless it resembled in an essential particular all other engraved plates—that is to say, unless it possessed a grain,—a something which the pure photograph does *not* possess. All engravings, whether line, or mezzotint, or aquatint, exhibit lines, or spots, or a grain; and a Photo-Glyphic engraving, or Photo-Galvanograph, or any kind of proof drawn from a plate engraved by Photography, must also of necessity exhibit a grain; so that to obtain a pure photograph in Carbon from such plates is an absolute impossibility, and the only subjects which could be copied truthfully by such methods of engraving, when perfected, are those which are composed entirely of lines, or dots, or black and white patches,—such as prints, or printed matter, or manuscript; natural lights and shadows could not be faithfully represented by such means. The reader will therefore perceive why Mr. Fox Talbot, in his new process, introduces the aquatint ground; and why Herr Pretsch, in his process of Photo-Galvanography, introduces the means of obtaining a grain.

It is evident therefore that all processes of Photographic Engraving are of necessity imperfect, and must be limited in their application when the absolute truthfulness of photography is required; and in addition to the serious defect under which they lie, it must be borne in mind that printing from engraved plates is a much more difficult, tedious, and costly operation, than printing from engraved wood blocks; and that the latter can be printed along with ordinary type, which the former cannot,—so that when the assistance of an artist is required to doctor an imperfect plate it would be better for him to cut at once from a photograph upon a wood block.

All these things being carefully weighed and considered it does not appear to us that the processes of Photographic Engraving, containing as they do an unavoidable error of principle, are by any means of equal promise with the processes of Photo-Lithography, Carbon-Printing, and Photo-Xylography; and we believe that the future of Photography in Carbon lies in the perfecting of the two former of these processes, while if the latter could be so far improved as to enable the wood-engraver to cut the *finest* work from a collodion positive upon a wood block, the utility of that process would be immense.

We do not therefore hail with so much enthusiasm as some of our contemporaries Mr. Talbot's new process, nor do we perceive in it the elements of any great practical utility. For certain purposes however it may be found useful, and should this prove to be the case we shall not fail to call attention from time to time to what is doing in this direction. Two or three years ago we should have been more sanguine of the success of this process than we are at present, but the ill-success of the operations of the Photo-Galvanographic Company has impressed us with the conviction that photographs with a grain will never be appreciated by the public. If we are to depart from pure photography why not at once hand over photographs upon wood to the wood-engraver, to be worked up into artistic pictures, and printed along with ordinary type. In Photo-Lithography grain is not an indispensable necessity, and if the printing press is to be employed in the multiplication of pure photographs, these must be photo-lithographs and not photo-glyphs.

We have given at page 268, the Specification of a patent recently taken out in England by Mr. William Newton, for the process of Photo-Lithography which is now being so extensively and successfully employed in America by Messrs. Cutting and Bradford, of Boston, U. S. This process differs in an important particular from that of M. Poitevin, (which is also patented in England). The Specification of M. Poitevin's patent runs thus:—

"I print photographically with ink of a greasy nature on paper, lithographic stone, metal, glass, or other suitable material, in the following manner:—I apply upon the surface which is to receive the design one or more layers or films of a mixture of equal parts of a concentrated solution of albumen, fibrine, gum arabic, gelatine, or similar organic substance, and a concentrated solution of a chromate or bi-chromate of potash, or of any base which does not precipitate the organic matter of the first solution. This single or compound layer or film is then dried if the photographic impression is to be produced by contact; or it may be used in a moist state when the photographic impression is to be produced in the camera obscura. In producing the impression by contact, the surface is covered with a photographic negative picture, or an engraving, or other transparent or partially transparent object, or screen, and then exposed to light, as in the ordinary photographic process. After a sufficient exposure, if the surface has become dry or has been used in a dry state, it is moistened with water by means of a sponge, and, while moist, the greasy ink or matter is applied to the surface by a ball or dabber, or by a roller or press, or otherwise, and it will be found to adhere to those parts only which have been affected by light. Thus, if the screen employed be a negative, having the lights and darks reversed, the print will be a positive, with the lights and darks correct; and, if the screen be a positive, the print will be a negative. The print may be retained on the surface on which it is first produced, or it may be transferred or printed upon paper or other suitable material, and the operation repeated. I thus obtain a design upon lithographic stone, or other suitable material, from which I am enabled to multiply impressions by the method of lithographic printing by inking the moistened surface with a greasy ink."

In M. Poitevin's process the blacks of the proof are produced by the ink from the roller adhering to those parts where light *has* acted, while in the process of Messrs. Cutting & Bradford the blacks are produced by the ink adhering to those parts of the stone where light has *not* acted. This difference between the two processes is very important, and, so far as we have seen, the American Photo-Lithographs are the best.

The following extract is from a recent number of the "Building News":—

"M. Negre has lately communicated to the Academy of Sciences in Paris a method for engraving metals by the action of the sun, which, by the subsequent aid of the electro-typing process, promises to render the art of engraving on copper and steel plates obsolete. He first coats a metal plate with a sensitive varnish, composed of gelatine and bi-chromate of potass, or of asphaltum dissolved in spirits or in benzoin, and then submits it to the action of light through a negative *cliche* reversed, or through an ordinary positive proof, accordingly as it may be desired to obtain an engraving for copper-plate printing or for printing with letter-press. After the plate has been sufficiently exposed to the sun's rays those portions of the sensitive varnish are removed by a solvent, composed of oil of naptha, or of petroleum, benzoin, or spirits, when the varnish consists of asphaltum, and by means of water, when it is composed of gelatine or gum. The plate will then exhibit a re-production of the photograph, by means of portions of its surface being left bare, and others coated with the insulating varnish. In this state, it is regarded as a matrix, so to speak, and a layer of metal, less oxydisable than that of the plate, is deposited by electro-galvanic agency upon the exposed portions. Thus, if the plate be of zinc, iron, or steel, the deposited metal is copper, silver, or gold; but if the plate be of copper, or its alloys, the deposit is gold. Next, the heliographic image formed by the sensitive varnish acted on by the light, and which in the electro-galvanic process just described has served the office of an insulating mixture, is removed but the design is still preserved by the contrast of the exposed surface of the plate and those of the deposited metal. Subsequently the design is bitten in, that is to say, the plate is covered with a diluted acid, which will corrode the metal off the plate where it is exposed, but which will not attack the deposited metal. If the plate be of zinc, iron, or steel, and the deposited metal of copper or silver, sulphuric acid is employed, and nitric acid if the plate be of copper or silver and the deposited metal gold. Or the plate may be corroded by being used as an anode, submitted to the action of a galvanic battery in a neutral solution of a salt of the same, or of a similar metal. How far plates so prepared may be employed in copper-plate printing, is a point to be determined. In letter press printing they would not succeed. We speak positively, and from ex-

perience. The acid used to bite the design corrodes laterally as well as downwards; the consequence is that as much greater depth is required for the whites than for the blacks in copper-plate printing, the reliefs are undermined, become rotten, and break in under the pressure necessary to be employed for letter-press printing."

The following method of transferring the collodion film has been patented in America, by Mr. Edward Howell, of Ashtabula, Ohio, and is described by Mr. Seely, as follows :—

"The glass plate on which the positive is to be made is first prepared by coating it with a thin film of wax, or its equivalent. This he effects by warming the plate, after being thoroughly cleaned, till a small quantity of wax laid on its surface melts and flows over it. To equalise the stratum of wax and make it quite thin, he uses a cotton buff, in the manner of buffing Daguerreotype plates. The plate is now ready for taking the picture in the ordinary way. After the picture is fixed, washed and dried, it is covered by flowing with a black varnish, rendered more adhesive and tacky by the addition of a little Canada balsam. When the varnish is nearly dry, yet still a little tacky, the paper (previously cut to shape and soaked in water), is laid on and pressed in close contact by means of a small roller covered with a cushion of cloth.

"I am assured by Mr. Howell that a failure is never necessary. The solvent of the varnish may be benzole, chloroform, or ether. I think it would be an improvement to apply the wax in solution with benzole or camphine."

The plan we suggested in our last for transferring old prints to wood blocks is successful. Our engraver, Mr. Thomas, of No. 11, Sergeant's Inn, Fleet-street, says, in reply,—"The mixture you have suggested answers most admirably." According to a letter which we have received from Mr. White, of Durham, and for which we beg to thank him, the alcohol may be dispensed with, and the caustic potass alone employed.

We have received from Mr. W. Russel Sedgfield a selection from the series of Stereoscopic Views published by him, and advertised in the present number. The subjects are mostly very artistic, and the manipulation perfect, but in our opinion the interiors of the Cathedrals of Winchester, Exeter, and Salisbury are the most remarkable; we can imagine nothing finer; and everyone who possesses a stereoscope should certainly add them to his collection.

The amount subscribed for the purchase of Mr. Pouncy's process now so nearly reaches £100 that Subscribers may consider it tolerably certain that the process will be published in all its particulars in an early number of this Journal. They must therefore be good enough to transmit at once to Mr. J. Pouncy, High West Street, Dorchester, by P.O., the sum they have kindly promised to subscribe. The matter will then stand thus:—should the entire sum received by him fall short of £100 he will transmit to Subscribers a private copy of the particulars of his process, for their sole use, until the full amount is realized; but we think it nearly certain that the £100 will be made up, and the process published in our next number. Our intention was to have ourselves made good any little deficiency that might occur towards the end of this transaction, and to have concluded the list with our own subscription, but having very recently sustained a heavy pecuniary loss, in consequence of the complete destruction of our laboratory by fire, we are scarcely at this moment in a position to carry out that intention. The matter must therefore be left more completely in the hands of Subscribers. On the conclusion of the business a correct list will be published of the names of those to whom photographers are indebted for the purchase and publication of this important process, together with the sum actually subscribed by them; and we hope that many will increase their subscription in order to remove any difficulties which may occur at the last.

We have from the first strongly advocated Mr. Pouncy's process of Carbon-Printing, because we feel convinced that it is the true solution of the problem of permanent printing, and that the future of photography upon paper lies in this direction. Positive printing has for many years occupied much of our attention, and we had not been three months engaged in experimenting before we became convinced that the method of printing and toning now commonly employed was wrong in principle, and if persevered in would bring photography into disrepute. This we endeavoured emphatically to point out in a series of letters which appeared in the Photographic Journal in the year 1853, and the remedy we then suggested was the substitution of gold for silver in the proof, by means of a toning-bath of sel-d'or, which preceded and was independent of the fixing bath of *fresh* hypo. The experience of five years has proved that that process yields proofs which are so far permanent that we have never known one of our own to fade. It is not, however, entirely free from objections and difficulties, for the prints are sometimes inky in color, the material costly, and the manipulation a little troublesome. Some operators have endeavoured to improve upon that process by the substitution of chloride of gold for sel-d'or, but this is wrong in principle, because oxide of gold is substituted for oxide of silver, in *both* cases, while the liberated

chlorine in one case destroys a portion of the material of the image, which remains quite unaffected in the other case. Observing, therefore, at that time the good effects of sel-d'or toning, and remarking shortly after the great stability of negatives produced by development as compared with that of positives produced by sun-printing, we endeavoured to combine gold-toning with development-printing, and the result of these experiments was so successful, and the proofs so entirely to our taste in their color and artistic qualities, that we immediately published the process in a pamphlet, and proceeded, in conjunction with M. Blanquart-Evrard, to carry it out professionally. Out of some thousands of prints issued by us, and bearing the stamp "Permanent Photograph," only one has been returned as faded, (from a lady residing in the north of England), and strange to say, this has *not* faded, but is merely a mealy print. But these prints, which were upon plain paper, were not generally liked, partly because they possessed less vigor and brilliancy than albumenized prints, and partly because they were deficient in modulation of tone, which fault was attributed by certain persons to an inherent defect in the development process, instead of to the true cause, viz., the too great density of the negatives. (It is surely quite absurd to attribute to the process of development of a latent image an inherent defect when employed in positive printing upon paper, which does not occur either in Collodion Positives or Negatives, or in printing upon glass from transparencies, or by superposition). Such then was the state of affairs when Mr. Pouncy sent us his first Carbon print, and in that print, faulty as it was, we perceived the germ of an important new printing process, because there was black and white with gradation of shade, and also sharp definition of straight lines; and the faults, which consisted in want of vigor and the presence of grain or smudginess, we attributed to the wrong kind of paper having been employed, and to improper manipulation in some stage of the process. But there evidently lay the germ of a valuable new process, and now that it has been greatly improved it becomes important to discuss the principle on which it is founded.

In Carbon-Printing, vegetable carbon is intimately mixed with gum arabic and bichromate of potass; a piece of paper is then blackened with this mixture, dried, and exposed to light under a negative; it is then put into water, which after a time completely dissolves out the black stuff from those parts where light has *not* acted, leaving it permanently attached to the paper in the parts where light *has* acted, which parts form the shadows of the picture. Now, it has been urged as an objection to this process, that half-tones cannot be produced by it, because light does not *immediately* render the gum insoluble, but causes it to pass through various stages between solubility and insolubility, and when the action is stopped at any one of these stages it must depend upon the treatment which the print receives in the final washing whether the partially insoluble gum, along with its adherent carbon, is to remain in the paper or be removed. There is some show of reason in this opinion, but we believe it to be incorrect and opposed to facts. The probability is that the atoms of gum do *not* pass through any intermediate stage between solubility and insolubility, but pass at once from one state to the other the instant that the bi-chromate is deoxydized by light; and thus atom by atom of gum and carbon are combined with an atom of reduced chromium salt, so as to form an atom of insoluble black cement firmly attached to the paper. *These black atoms accumulate in quantity dependent upon the intensity of the light and the time of its action*, and thus the deep blacks and all the half-tones are produced; and on washing the print it is found just as impossible to remove the paler shades as the deepest blacks; in fact the print is faithful to the negative, and no artifice in the washing can obliterate any part of it; it might be dragged across the Atlantic behind the stern of a vessel, and the half-tones remain as permanently fixed and as unalterable as the strongest blacks. In short, the objection that we have endeavoured to remove is as absurd as it would be to suppose that in sun-printing there are an infinity of gradations between chloride and sub-chloride of silver, and that none of these gradations of shade would appear in the finished print. We imagine that in sun-printing the atom of chloride exposed to light passes *at once* from chloride to sub-chloride, and that the deepening tint due to continued exposure is produced by the *accumulation* of atoms of sub-chloride. It is certainly as wrong to suppose that in sun-printing the whole mass of chloride is simultaneously acted on and passes *by degrees* to sub-chloride through an infinity of intermediate stages, as to suppose that a mass of carbon mixture passes *gradually* from solubility to insolubility. No. The analogy between Carbon-Printing and chloride-printing, and all kinds of sun-printing is no doubt perfect.

We have therefore strongly advocated Carbon-Printing because we believe it to be correct in principle, and that the utmost degree of vigor, finish, and gradation of tone

may be obtained in this way by using the proper tablet to print upon. As for the objections which have been raised to it, it is right that a matter of this kind should be thoroughly discussed; let us hear the objections by all means; and when the process is published let all photographers try it and compare notes; if good it will stand,—if not it will go to the wall. Mr. Pouncy has sent prints to a great many influential persons, but he has only one pair of hands and other business to attend to, that is why more have not been publicly exhibited. Those who have not seen any of these specimens must have faith for a little while, and, as we trust that we have never yet deceived our readers in any matter, place confidence in our opinion that the process is one of *great promise*, and well worthy of their notice.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

ANNUAL MEETING, OCTOBER 26, 1858.

The Vice-President, W. Howell, Esq., in the Chair.

The Minutes of the last Meeting having been read and confirmed,

Mr. Davis, of Tamworth, was ballotted for and duly elected a Member of the Society.

Some slight alterations in Rules 2, 3 & 10, were then proposed and adopted.

The Secretary then read the following Report of the state of the Society:—

"Your Council, in thus bringing before you their Second Annual Report, have to congratulate you again upon the prosperous state of the Society.

"During the past year many highly interesting and instructive papers have been read, some by your own Members, and others by various gentlemen who have kindly consented to do so, at the request of your Council; and your Council take this opportunity of urging upon you the necessity of all contributing, as far as possible, to this branch of the Society's work.

"They also have to regret the thin attendance at many of the Meetings, and to urge upon Members the necessity of being present in greater numbers.

"Since your last Annual Meeting you have lost three Members, one of whom has been removed from you by death, and two have tendered their resignation. Against this you have the addition of five new Members, and your Council earnestly entreat the co-operation of all to promote the addition to your Members so necessary to the welfare of the Society.

"In the Autumn of last year, as you are aware, your Society sustained a heavy loss, in consequence of the comparative failure of its Exhibition; your Council, however, have the pleasure to report, that owing to most of your Members having kindly acceded to their request that they would for the then current year double their Subscriptions, the difficulty is now removed, and your Treasurer's report shows a balance in favor of the Society of £3 12s. 6d.

"Your Council have also to report that your Society intends, early in March next, to open a Permanent Exhibition of Photographs, at Aston Hall, in connection with the Aston Hall Company's Exhibition, and requests the help of all its Members in aid of the formation of the same.

"As the room at Aston Hall, where this Exhibition is proposed to be held, has been kindly lent, free of expense, by the Aston Hall Company, the expense to the Society will be merely nominal, thus enabling it to reap the benefits to be derived thereby at a moderate cost.

"Your Library has during the past year been increased by the kind donation of several books, by several gentlemen; and it has been considered advisable that in future the books, journals, &c., contained therein, shall be kept at the Secretary's office, from whom any book may be obtained on application.

"Your Council regret to say that the contributions to the Album have not been so numerous as they could wish, and they sincerely hope and request that during the year which is now commencing, each Member will contribute his share towards filling its pages.

"At this Meeting you will have to elect your Officers for the ensuing year, as also new Members of Council, in place of those who, according to your rule, annually retire, but who are, however, eligible for re-election."

The thanks of the Meeting were then given to the President, Vice-President, Treasurer, and Secretary, and the following gentlemen were elected as Council for the ensuing year:—

President.
SIR FRANCIS E. SCOTT, Bart.

Vice-Presidents.
GEORGE SHAW, Esq., F.G.S.
W. HOWELL, Esq., L.R.C.P.

Council.

Mr. C. J. PHILLIPS.	Mr. HOLYOAKE.
" J. T. BROWN.	" BOURNE.
" T. MORRIS.	" BALL.
" J. O. C. PHILLIPS.	" HART.

Mr. Osborn then called attention to the Subscription List for the purchase of the Pouncy process. Several of the Members at once put down their names.

A discussion then ensued upon Mr. Sutton's paper, published in the *Notes* of Oct. 1st.

Mr. Osborn, in opening the discussion, said that he proposed to take the principal points of the paper *seriatim*, and would commence with the mounting of the lens. He was decidedly of opinion that the central diaphram between the aperture and the lens in the tube of the landscape lens was a great improvement, as also the annulus round the outer surface of the lens itself; by this means they would get rid of a great deal of reflected

light, and render the picture much sharper and clearer. In the portrait combination the centre diaphram was now generally used.

Mr. Howell asked if Mr. Rejlander did not, on a previous occasion, recommend the use of old velvet for the lining of lenses.

Mr. Osborn replied that it was for the lining of cameras.

Mr. Holyoake said that he had tried the experiment of having inner diaphrams in the lens tube, but he could not perceive any advantage.

Mr. Howell said many writers seemed to be opposed to the use of a small diaphram, as affecting the beauty of the picture, by forcing the rays through a small aperture.

Mr. Morris said he had had lenses to alter several times, the complaint being that a white spot in the positive and a dark spot in the negative were formed, owing to reflected light in the lens.

The discussion then turned upon the other points suggested by Mr. Sutton's paper, with regard to the focusing on the film.

Mr. Osborn suggested the use of a revolving disc, containing two pieces of yellow glass and two apertures; this to be fastened behind the lens; it would then be applicable for instantaneous pictures.

PHOTO-GLYPHIC ENGRAVING.

NEW PROCESS OF WILLIAM H. FOX TALBOT, ESQ., OF LACOCK ABBEY, WILTSHIRE.

Patent, dated 21st April, 1858.

"The process described in this Specification, to which I have given the name of Photo-Glyphic Engraving, is performed in the following manner:—In this invention I employ plates of steel, copper, or zinc, such as are commonly used by engravers. Before using a plate, its surface should be well cleaned. It should then be rubbed with a linen cloth dipped in a mixture of caustic soda and whiting, in order to remove any remaining trace of greasiness. The plate is then to be rubbed dry with another linen cloth. This process is then to be repeated, after which the plate is in general sufficiently clean.

"In order to engrave a plate, I first cover it with a substance which is sensitive to light. This is prepared as follows:—About a quarter-of-an-ounce of gelatine is dissolved in eight or ten ounces of water by the aid of heat. To this solution is added about one ounce, by measure, of a saturated solution of bi-chromate of potash in water, and the mixture is strained through a linen cloth. The best sort of gelatine for the purpose is that used by cooks and confectioners, and commonly sold under the name of gelatine. In default of this, isinglass may be used, but it does not answer so well. Some specimens of isinglass have an acidity which slightly corrodes and injures the metal plates. If this accident occurs, ammonia should be added to the mixture, which will be found to correct it. This mixture of gelatine and bi-chromate of potash keeps good for several months, owing to the antiseptic and preserving power of the bi-chromate. It remains liquid and ready for use at any time during the summer months, but in cold weather it becomes a jelly and has to be warmed before using it. It should be kept in a cupboard or dark place. The proportions given above are convenient, but they may be considerably varied without injuring the result. The engraving process should be carried on in a partially darkened room, and is performed as follows:—

"A little of this prepared gelatine is poured on the plate to be engraved, which is then held vertical, and the superfluous liquid allowed to drain off at one of the corners of the plate. It is then held in a horizontal position over a spirit lamp, which soon dries the gelatine, which is left as a thin film of a pale yellow color, covering the metallic surface, and generally bordered with several narrow bands of prismatic colors. These colors are of use to the operator by enabling him to judge of the thinness of the film. When it is very thin, the prismatic colors are seen over the whole surface of the plate. Such plates often make excellent engravings, nevertheless it is perhaps safer to use gelatine films, which are a little thicker. Experience alone can guide the operator to the best result. The object to be engraved is then laid on the metal plate and screwed down upon it in a photographic copying frame. Such objects may be either material substances, as lace, the leaves of plants, &c., or they may be engravings, or writings, or photographs, &c., &c.

"The plate bearing the object upon it is then to be placed in the sunshine for a space of time varying from one to several minutes according to circumstances. Or else it may be placed in common daylight, but of course for a longer time. As in other photographic processes the judgment of the operator is here called into play, and his experience guides him as to the proper time of exposure to the light. When the frame is withdrawn from the light and the object removed from the plate, a faint image is seen upon it, the yellow color of the gelatine having turned brown wherever the light has acted. This process, as far as I have yet described it, is in all essential respects identical with that which I described in the Specification of my former Patent for 'Improvements in Engraving,' bearing date the 29th October, 1852. The novelty of the present invention consists in the improved method by which the photographic image obtained in the manner above described, is engraved upon the metal plate. The first of these improvements is as follows:—I formerly supposed that it was necessary to wash the plate bearing the photographic image in water, or in a mixture of water and alcohol, which dissolves only those portions of the gelatine on which the light has not acted. And I believe that all other persons who have employed this method of engraving, by means of gelatine and bi-chromate of potash, have followed the same method, viz., that of washing the photographic image. But however carefully this process is conducted it is frequently found, when the plate is again dry, that a slight disturbance of the image has occurred, which of course is injurious to the

beauty of the result. And I have now ascertained that it is not at all necessary to wash the photographic image. On the contrary, much more beautiful engravings are obtained upon plates which have not been washed, because the more delicate lines and details of the picture have not been at all disturbed. The process which I now employ is as follows:—When the plate bearing the photographic image is removed from the copying frame, I spread over its surface, carefully and very evenly, a little finely-powdered gum copal (in default of which common resin may be employed). It is much easier to spread this resinous powder evenly upon the surface of the gelatine, than it is to do so upon the naked surface of a metal plate. The chief error the operator has to guard against is, that of putting on too much of the powder; the best results are obtained by using a very thin layer of it, provided it is uniformly distributed. If too much of the powder is laid on, it impedes the action of the etching liquid. When the plate has been thus very thinly powdered with copal, it is held horizontally over a spirit lamp, in order to melt the copal. This requires a considerable heat. It might be supposed that this heating of the plate after the formation of a delicate photographic image upon it, would disturb and injure that image, but it has no such effect. The melting of the copal is known by its change of color. The plate should then be withdrawn from the lamp and suffered to cool. This process may be called the laying an aquatint ground upon the gelatine, and I believe it to be a new process. In the common mode of laying an aquatint ground, the resinous particles are laid upon the naked surface of the metal before the engraving is commenced. The gelatine being thus covered with a layer of copal, disseminated uniformly and in minute particles, the etching liquid is to be poured on. This is prepared as follows:—Muriatic acid, otherwise called hydro-chloric acid, is saturated with per-oxide of iron, as much as it will dissolve with the aid of heat. After straining the solution to remove impurities, it is evaporated till it is considerably reduced in volume, and is then poured off into bottles of a convenient capacity. As it cools, it solidifies into a brown semi-crystalline mass. The bottles are then well corked up and kept for use.

"I shall call this preparation of iron by the name of per-chloride of iron in the present Specification, as I believe it to be identical with the substance described by chemical authors under that name. "For example, see *Turner's Chemistry*, 5th edition, p. 537, and by others called per-muriate of iron; for example, see *Brande's Manual of Chemistry*, 2nd edition, vol. 2, p. 117. It is a substance very attractive of moisture. When a little of it is taken from a bottle in the form of a dry powder, and laid upon a plate, it quickly deliquesces, absorbing the atmospheric moisture. In solution in water, it forms a yellow liquid in small thicknesses, but chesnut brown in greater thicknesses. In order to render its mode of action in Photo-Glyphic engraving more intelligible, I will first state that it can be very usefully employed in common etching, that is to say, that if a plate of copper, steel, or zinc, is covered with an etching ground, and lines are traced on it with a needle's point so as to form any artistic subjects, then, if the solution of per-chloride of iron is poured on, it quickly effects an etching and does this without disengaging bubbles of gas or causing any smell, for which reason it is much more convenient to use than aqua-fortis, and also because it does not injure the operator's hands or his clothes, if spilt upon them. It may be employed of various strengths for common etching, but requires peculiar management for Photo-Glyphic engraving. And as the success of that mode of engraving chiefly turns upon this point, it should be well attended to.

"Water dissolves an extraordinary quantity of per-chloride of iron, sometimes evolving much heat during the solution. I find that the following is a convenient way of proceeding:—

"A bottle (No. 1) is filled with a saturated solution of per-chloride of iron in water. A bottle (No. 2) with a mixture consisting of five or six parts of the saturated solution, and one part of water; and a bottle (No. 3) with a weaker liquid, consisting of equal parts of water and of the saturated solution. Before attempting an engraving of importance, it is almost essential to make preliminary trials, in order to ascertain that these liquids are of the proper strength. These trials I shall therefore now proceed to point out. I have already explained how the photographic image is made on the surface of the gelatine, and covered with a thin layer of copal or resin, which is then melted by holding the plate over a lamp. When the plate has become perfectly cold, it is ready for the etching process, which is performed as follows:—

"A small quantity of the solution in bottle No. 2, namely, that consisting of five or six parts of saturated solution to one of water, is poured upon the plate, and spread with a camel's-hair brush evenly all over it. It is not necessary to make a wall of wax round the plate, because the quantity of liquid is so small that it has not a tendency to run off the plate. The liquid penetrates the gelatine wherever the light has not acted on it, but it refuses to penetrate those parts upon which the light has sufficiently acted. It is upon this remarkable fact that the art of Photo-Glyphic engraving is mainly founded. In about a minute the etching is seen to begin, which is known by the parts etched turning dark brown, or black, and then it spreads over the whole plate, the details of the picture appearing with great rapidity in every quarter of it. It is not desirable that this rapidity should be too great, for in that case it is necessary to stop the process before the etching has acquired sufficient depth, (which requires an action of some minutes' duration). If therefore the etching on trial is found to proceed too rapidly, the strength of the liquid in bottle No. 2 must be altered (by adding some of the saturated solution to it), before it is employed for another engraving. But if, on the contrary, the etching fails to occur after the lapse of some minutes, or if it begins, but proceeds too slowly, this is a sign that the liquid in bottle No. 2 is too strong, and too nearly approaching saturation. To correct this a little water must be added to it before it is employed for another engraving. But in doing this, the operator must take notice that a very minute quantity of water added after, makes a great difference, and causes

the liquid to etch very rapidly. He will therefore be careful in adding water, and not do so too freely. When the proper strength of the solution in bottle No. 2 has thus been adjusted, which generally requires three or four experimental trials, it can be employed with security. Supposing, then, that it has been ascertained to be of the right strength, the etching is commenced as above-mentioned, and proceeds till all the details of the picture have become visible, and present a satisfactory appearance to the eye of the operator, which generally occurs in two or three minutes, the operator stirring the liquid all the time with a camel's-hair brush, and thus slightly rubbing the surface of the gelatine, which has a good effect. When it seems likely that the etching will improve no farther, it must be stopped. This is done by wiping off the liquid with cotton wool, and then rapidly pouring a stream of cold water over the plate, which carries off all the remainder of it. The plate is then wiped with a clean linen cloth, and then rubbed with soft whiting and water to remove the gelatine. The etching is then found to be completed.

"I will now describe another etching process, very slightly differing from the former, which I often use. When the plate is ready for etching, pour upon it a small quantity of the liquid No. 1 (saturated solution). This should be allowed to rest upon the plate one or two minutes. It has no very apparent effect, but it acts usefully in hardening the gelatine. It is then poured off from the plate and a sufficient quantity of solution No. 2 is poured on. This effects the etching in the manner before described, and if this appears to be quite satisfactory, nothing further is required to be done. But it often happens that certain faint portions of the engraving, such as distant mountains or buildings in a landscape, refuse to appear, and as the engraving would be imperfect without them, I recommend the operator in that case to take some of the weak liquid, No. 3, in a little saucer, and without pouring off the liquid No. 2, which is etching the picture, to touch with a camel's-hair brush, dipped in liquid No. 3, those points of the picture where he wishes for an increased effect. This simple process often causes the wished-for details to appear, and that sometimes with great rapidity, so that caution is required in the operator in using this weak solution No. 3, especially lest the etching liquid should penetrate to the parts which ought to remain white. But in skilful hands its employment cannot fail to be advantageous, for it brings out soft and faint shadings, which improve the engraving and which would otherwise probably be lost. Experience is requisite in this as in most other delicate operations connected with photography, but I have endeavoured clearly to explain the leading principles of this new process of engraving according to the mode which I have hitherto found the most successful.

"With respect to the second invention mentioned in my provisional Specification, in which the electrotype process is employed, I have found that it gives less successful results than that which I have fully described above, and I have therefore omitted it from this Specification, and make no claim with respect to it.

"In conclusion, I would remark that besides the process of Photo-Glyphic engraving, considered as a whole, being new, I believe the following points also to be new, viz.:—

"First,—The etching a photographic image formed upon a surface of gelatine and bi-chromate of potash without first disturbing that surface by washing it with water or alcohol.

"Second,—The laying an aquatint ground of resin or copal upon a surface of gelatine, and not, as usual, upon the naked metallic surface of the plate.

"Third,—After forming a photographic image on gelatine the heating it strongly over a spirit lamp or otherwise.

"Fourth,—The use and employment of perchloride of iron as an etching liquid for the production of Photo-Glyphic engravings.

"Fifth,—The use and emyloyment of the same as a substitute for aqua-fortis in common etching."

It may be interesting to our readers to compare Mr. Talbot's present patent with his former one, dated October 29th, 1852, the Specification of which is as follows :—

"The following is my method of engraving steel plates:—I take a good steel plate, prepared as it usually is for the use of engravers; and, first, I dip it for a minute or two into vinegar acidulated with a little sulphuric acid, then wash it and wipe it quite clean and dry. Then I prepare a solution of gelatine or common isinglass in water. It should be made of moderate strength, such as when cold coagulates into a firm jelly. Having warmed this solution, and strained it through a linen cloth, I add to it about half its volume of a saturated solution of bi-chromate of potash in cold water, and stir the mixture well. This mixture is to be kept moderately warm while in use to prevent its coagulation; and since this warmth causes it gradually to part with its water, and grow thicker or more viscid, therefore it is necessary that the operator should from time to time add so much water as he judges necessary to replace what has been lost. The steel plate, being first slightly warmed, I pour some of the prepared gelatine upon it, and with a glass rod, held horizontally, I spread it over the whole plate. I then incline the plate, and pour off the superfluous gelatine. I then place it on a stand, which should be kept as nearly horizontal as possible to prevent the gelatine from flowing to one side of the plate. I then place a spirit lamp beneath the plate, and warm it gently till the gelatine is dry. This process should not be performed in very strong daylight, because the prepared gelatine would be injured by the light. The film of prepared gelatine, when properly dried upon the steel, has an uniform bright yellow color, and a smooth surface. If too much bi-chromate is employed in proportion to the gelatine, the surface of the dried film appears clouded in various parts, owing to the formation of minute crystals. This defect is easily remedied by adding some more fresh gelatine to the mixture. After a little practice the operator will have no difficulty in obtaining a uniform film. When the steel plate has been in this manner coated with a regular and uniform film of prepared gelatine, it is ready to receive a photographic image of the object which is intended to be engraved. I will suppose, in the first place, that the object is capable of being applied in close contact with the surface of the prepared steel plate; for

example, a piece of lace, or the leaf of a plant. I place the object upon the steel plate: then a sheet of glass is laid over it, and screwed into close contact with it, which is best done by means of what is commonly called a photographic copying frame. The plate is then to be exposed to the sun's rays for a certain time, varying according to circumstances from half-a-minute to five minutes, or more, until the operator judges that a sufficiently strong image has been produced. The effect of the sun's rays is to turn the color of the plate from yellow to brown, but the parts shaded or protected by the object of course retain their original yellow; the result is therefore the formation of a yellow image of the object upon a ground of a brown color. The plate is then taken out of the frame, and the object being removed from it, it is seen whether a good image has been obtained. In that case the operator proceeds as follows:—The plate is taken and dipped into cold water for one or two minutes, which removes all the bi-chromate of potash, and the greater part of the gelatine also, from the parts of the plate upon which the sun's rays have not acted, while on the contrary it removes but little from those parts which have been fully exposed to the sunshine; the consequence of this is that the image is whitened. The plate is then removed from the water, and dipped into alcohol for one minute. It is then removed, and placed in a vertical position in some warm place, and in the course of a few minutes it becomes entirely dry. This completes the photographic part of the process; and the plate is, generally speaking, now seen to be impressed with a white image of the object, often very perfect and beautiful, placed upon a ground of a brown or brownish-yellow color.

"It now remains to etch the photographic image thus obtained. For that purpose I take some bi-chloride of platina, containing a little free acid, and dissolve it in cold water, taking care that the solution is quite saturated. I then add to four parts of this saturated solution one part of water. This part of the process requires attention, for if the quantity of water is in a material degree either too great or too little, the etching process is liable to failure. The best way is to proceed experimentally by adding water gradually to a considerable quantity of the saturated solution, and making trial of the results until they become satisfactory. When this is attained the solution is to be kept in a well stoppered bottle for immediate use at any time. A solution of the proper strength having been carefully prepared, and tested as above-mentioned, the etching process is executed as follows:—The plate is laid horizontally on a table, and a small portion of the platina solution is poured upon it, and quickly diffused and spread over the whole plate with a camel's-hair brush. It is hardly necessary to surround the plate with a wall of wax, as practised by engravers, in the usual mode of etching copper plates, although this may be done if preferred. But the liquid does not often flow off the plate, in consequence of the small quantity of it which is used. If a greater depth of it were poured on, it would, from its great opacity, prevent the operator from discerning the effects produced by it upon the plate of metal. The platina solution then being poured on the plate it produces no effervescing or escape of gas, but in the course of a minute or two the whole photographic image of the object which existed upon the steel plate is seen to blacken, and when this change is complete there is seen a very distinct and regular black image of the object. The operator watches until it has a satisfactory appearance to his eye, and looks finished, or as perfect as he judges it likely to become, which generally happens in one or two minutes. When he thinks it is finished, or not likely to be further improved or developed, he inclines the steel plate gently, and pours off the platina solution by one corner of the plate into a bottle placed to receive it; the surface of the plate is then dried with blotting paper, and then a stream of water, or, what is better, a strong solution of salt in water, is poured over the plate, which carries off the remainder of the platina solution. The plate is then rubbed with a wet sponge, or linen cloth, which, in a short time, detaches and removes the film of gelatine from the steel, and enables the operator to see the etching which has been obtained. The plate ought then to be coated with wax, because a newly-prepared etching is very easily oxydated or rusted by the atmospheric air. Impressions can be printed off from the steel plate thus engraved in the mode usually employed by copper-plate and steel-plate printers.

"When the etched parts are both broad and uniform, as in the case, for instance, when the object is an opaque leaf of a plant, although the etching holds the ink pretty well, yet when printed off the effect is not always satisfactory. I proceed therefore to explain a useful modification of the process, in order to which I must observe that when the object placed on the steel plate to be engraved is a piece of black crape or gauze, an engraving of it is obtained in the way above-mentioned, which truly depicts the object, representing every thread in its proper place by a corresponding engraved line; but when two or three thicknesses of this gauze are employed instead of one, and are placed obliquely to each other at various angles, then the resulting engraving offers a mass of lines intersecting each other in different directions which cover the whole plate, and which, when printed off upon paper, produce a result which, to an eye at a little distance, appears like a uniform shading. Now let us suppose that we have in this way covered a prepared steel plate with two or three folds of black crape or gauze, and placed it in the sunshine. When taken out of the sunshine and the crape removed, let the broad leaf of a plant, or some other object of irregular outline, be placed upon the centre of the plate, and then let the plate be replaced in the sunshine for three or four minutes. When it is removed for the second time, and the object detached, it will be seen that the light of the sun, acting upon the parts of the plate exterior to the object, has wholly obliterated the previous effect produced by the gauze, and has converted that part of the plate to a uniform brown color, while the central part of the plate offers the image of the leaf, upon which the crowded intersecting lines produced by the gauze are still seen. The plate is now to be etched as previously described, and the result is, that an etching of a leaf is produced covered with engraved lines, which lines are entirely wanting on the rest of the plate. When this is printed off, the impressions offer the appearance of a leaf nearly uniformly shaded. But in order to obtain greater perfection in this respect, it is only necessary either to manufacture on purpose some pieces of more delicately woven fabrics, or to cover a sheet of glass by any convenient method with fine opaque lines, to intercept the light, or with a powder adhering to the glass, consisting of distinct opaque particles, and very uniformly diffused over the surface. These things, which I believe have not been heretofore used in the fine arts, I would denominate photographic screens or veils.

"Another method is to cover the steel plate with an aquatint ground, consisting of particles of resin, before coating it with the gelatine; but in that case the dipping of the plate into alcohol, which occurs in the foregoing description of my process, must be omitted; and moreover, a fresh aquatint ground requires to be laid upon every plate; whereas a single veil, such as I have above described, serves for any number of plates in succession. The method of engraving which I have here described as applied to steel plates is also applicable to plates of zinc. Lithographic stones are also readily engraved by the same process.

"When the object to be engraved is not of a nature to be placed in contact with the steel plate, it is necessary first to form a negative photographic image of it on paper or on glass by the usual methods employed in photography; then to make from this negative photograph a positive copy, either upon glass or upon paper of good uniform texture and moderately transparent; and, lastly, to put this positive copy in close contact with the steel plate, and then to place the plate in the sun's rays, when it will take an image of the object, as above described. The prepared steel plate may also be placed in the focus of a camera, and the camera directed to the object, but as the *film* of prepared gelatine is not very sensitive to *feeble* lights this process in general would occupy a considerable time.

"I have stated that I employ in this process a solution of gelatine mixed with bi-chromate of potash, but I do not confine myself to the use of gelatine. Other substances may be used, especially albumen or white of egg, and gum arabic, or mixtures of these and other analogous substances in various proportions. But notwithstanding that I have found some of these mixtures to afford good results, yet on the whole I think it answers best to employ only gelatine mixed with the bi-chromate of potash; and throughout this Specification I have used for brevity the term "gelatine," to denote a solution of isinglass in water, carefully strained and made as free from impurities as possible. And I have used the terms positive and negative as they are usually employed in the science of photography. I have described the solution of platina which seems to me the best, but I do not confine myself to this etching liquid. Other liquids may be employed capable of etching surfaces of metal or stone, provided they possess the essential quality of not penetrating the film of prepared gelatine which cover the portions of the surface not intended to be etched.

"The processes described in this Specification which I claim to be new Inventions, are,—

"First,—The producing or obtaining etchings or engravings by photographic and chemical means alone upon plates of steel.

"Second,—The method described of covering surfaces of metal or stone with a coating of gelatine, rendered sensitive to the action of light by being mixed with a solution of bi-chromate of potash or other liquid which possesses photographic properties, and which unites freely with gelatine, producing, when the gelatine is dried, a coating sensitive to light, and which by the action of the solar rays upon it becomes either less soluble in water than before, or altogether insoluble in that liquid.

"Third,—The removal by the action of water of the more soluble parts of the photographic image, for the purpose of rendering them permeable to an etching liquid.

"Fourth,—The employing a chemical liquid for the purpose of etching the surface upon which the photographic image has been formed, as above mentioned, which liquid possesses the requisite etching property, but has not the property of penetrating the coating of gelatine which covers and protects the portions of the surface not intended to be etched.

"And whereas, in reciting these claims, I use for brevity the word "gelatine," and I have already stated that albumen and gum possess analogous properties; I would therefore be understood to include them in my claim as being capable of replacing the gelatine in the above described process.

"Fifth,—the employing an apparatus for partially intercepting the sun's rays, which in my present Specification I have called a photographic screen or veil, for the purpose of producing a change or alteration in the final character of the etching."

SPECIFICATION.

PHOTO-LITHOGRAPHY.

No. 357.—WILLIAM EDWARD NEWTON, of the office for Patents, 66, Chancery Lane, in the County of Middlesex, *Civil Engineer*.—"An Improved Process for producing Photographic Pictures or Designs on the Surface of Stone or Metals so that impressions may be taken therefrom by the process of Lithographic Printing."—A communication from A. Cutting and Lodowick H. Bradford, of Boston, Massachusetts, in the United States of America.—*August* 21*st*, 1858.

"This Invention has for its object the production of a photographic picture upon the surface of a lithographic stone, from which impressions may be taken by the ordinary process of lithographic printing, by which I am enabled to greatly multiply the results of photography, and to avoid the tedious and expensive process of drawing upon the stone by hand, as at present practised. In the ordinary process of lithographic printing the surface of the stone, after the drawing is completed, is washed or coated with a solution of gum arabic in acidulated water. The gum thus applied enters into a close union with the surface of the stone, or adheres with great tenacity thereto, so that it cannot readily be removed by washing, and thus protects it from absorbing the ink employed in the printing process. In the process of Photo-Lithography it is found, however, that the gum arabic adheres so closely to the stone as not to be readily removed by washing from those portions not fixed by the light. On this account, in the experiments heretofore made in Photo-Lithography, it has been found impracticable to employ this gum, and a solution of gelatine has been used in its stead. Stones thus prepared, however, yield but few impressions, and are of comparatively small value in the arts. To remedy this difficulty is the object of this invention, which consists

in the employment of gum arabic which has been deprived of its power of intimate union with the stone, at the same time that it is rendered capable of becoming fixed or insoluble by the operation of light. When a stone, treated with the above-prepared gum, is subsequently submitted to the action of a solution of soap, the unlighted portions of the gum are readily and expeditiously removed, while the lighted portions are not injuriously affected thereby, at the same time that the soap performs its well-known duty of forming the insoluble soap upon the stone to produce the body or printing surface. The stone, after being prepared in a manner which will be more fully explained hereafter, has the following solution applied to its surface:—Water, one quart; gum arabic, 4 oz.; sugar, 160 grains; bi-chromate potassa, 160 grains; the sugar retarding the immediate fixing of the gum upon the stone, and the chromic salt causing it to become more firmly fixed or much less soluble on exposure to the light. The stone thus prepared is preserved in the dark until required, and when the coating is dried it may be exposed in the camera a suitable length of time to fix the gum upon those parts of the picture where the lights are to appear, or it may be covered by the print or picture to be reproduced and exposed to the light. After it is thus "lighted," the stone is washed with a solution of soap, which attacks the stone, removing the coating and fixing itself (or an insoluble soap formed by the mutual decomposition of the stone and the soap employed) upon the surface in place of the coating removed. Where the gummed surface has been entirely protected from the light, the gum is easily removed, and the soap has free access to the stone, and the consequence is a thorough union of the soap with its surface; where, on the contrary, the lights were strong, the gum having been rendered much more insoluble, is protected from the action of the soap, and is not affected by it; and at all intermediate points the effect of the soap upon the stone is inversely proportionate to the extent to which the gum was fixed by the light. The most delicate grades and tints of light and shade may thus be produced upon the stone, true to nature as the photographic picture itself. The stone having been thoroughly washed with clean water and dried, now receives a coating of ink from the roller, which, uniting with the soap already deposited thereon, serves to give additional body to the picture, and shortly after the stone is ready for the printer; the portions which have been protected by the undissolved or "lighted" gum when wet resisting the ink. Previous to the commencement of the above-described process the stone is to be prepared, and this preparation will vary according to the nature of the picture or subject to be produced. If it be a manuscript, a lithograph, line engraving, or any plan or line drawing without gradations of light or shadow, running the one into the other, a polished surface may be employed. This will not answer, however, so well for portraits, landscapes, and a great variety of other pictures in which the variations of shade blend the one into the other: in such cases it becomes necessary to give the stone a roughened surface, or, in the language of the workman, the stone is "grained." Into such a surface the chromated solution of gum sinks deeper, and is then removed more or less according as it has been fixed by the light, and thus the required variations of intensity and the gradations of light and shadow are produced. Where a polished stone is employed the chromated gum lies upon the surface, and it is found that the variations of light and shadow cannot be produced with that nicety necessary to make a perfect graduated picture such as a portrait that shall be easily printed.

"In preparing the chromated solution the proportions of the ingredients given above are by no means rigid, though they are those which we have found to answer the purpose. The sugar we have found also may be replaced by other substances, such as molasses, acetic acid, or various acetates not decomposible by the bi-chromate of potassa. I do not, therefore, confine myself to the exact proportions given above, nor even to the use of the exact substances named, when there are equivalents for them which may be used in their stead without departing from the essence of this invention. And in place of removing the unlighted portions of the coating by means of the direct application of soap, they may be washed off with water, acetic acid, or their equivalents; oils, resins, or printing inks being applied after the stone has been dried for the purpose of forming the required insoluble soap in the stone; such a process is the entire equivalent of the one above described, although it is neither so expeditious nor so efficient. The quality of the soap employed is not rigid, though those containing a proportion of resin will in general give a better result. The strength of the saponaceous solution is not material; ½-lb. of soap to six quarts of water has been found to answer the purpose. Heretofore this process has been spoken of as applied to lithographic stones, but there are other substances which may be employed in lieu of the stone to which it may be applied, one of which is zinc, which has been heretofore used by printers as a substitute

for stone; in the use of this metal an insoluble soap of zinc is formed instead of one of lime.

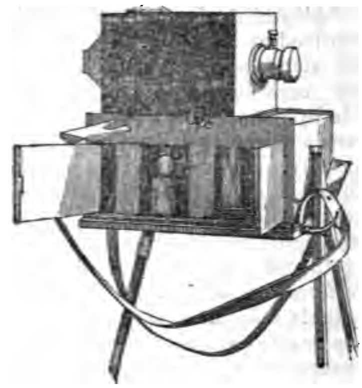
"Having now set forth the nature of this invention, and explained the manner of carrying the same into effect, I wish it to be understood, that under the above-recited Letters Patent, I claim the employment of gum arabic, deprived of its power of intimate union with the stone by means of sugar or its equivalent, as set forth, and in combination with the above I claim the use of soap, as set forth, for the purpose of readily removing the unlighted portions of gum and of forming the printing surface, as described.

"W. E. NEWTON."

NEW METHOD OF WORKING THE WET COLLODION PROCESS OUT-OF-DOORS.

To the Editor of Photographic Notes.

DEAR SIR,—I am tempted to send you a photograph of a new Stereoscopic, or View Camera, which I have invented and used for the last five years, and which, from its portability and simplicity, will, I think, be found by brother amateurs to be the long sought-for instrument,—the whole of the process being conducted in full daylight,—and it enables the operator to take any number of pictures by the wet collodion process. Should you think it of sufficient novelty to place before your readers, I hope you will do so. The article is not, and will not, be patented; my friend, E. Anthony, of Broadway, has a few of them made, and some other friends of mine are using them with much approval.



For the details I would refer you to the accompanying photographs, with dimensions; I also enclose some views taken by me. I have also made some larger instruments, on the same plan, for $6\frac{1}{2} \times 8\frac{1}{2}$, and also 20×15, but the increase of size increases the weight so much that I prefer the size now sent, as with the Solar camera I can throw out the views to any size required. Mine, when charged for a journey, weighs only $10\frac{1}{2}$ lbs., containing the silver bath, developing bath, collodion, and glasses. The method of using it is as follows:—

Having arrived at the spot, screw on the back leg, and place the front ones in their place, the work of a few moments; take out the holder at top and screw in the focusing glass; then replace it, and open the back slide and adjust the focus; withdraw the focusing glass, and substitute a clean negative glass; pour on your collodion, replace the holder, and fasten it; now pull out the front slide and side slide, and the communication is between the upper camera and the baths below; depress the holder steadily and continuously into the first, or silver bath, for one minute; the plate being now sensitive, must be drawn up into the upper box, and the slides closed; now expose. To develop, slide the upper box over to the iron bath; open the slides, and dip for one minute. On withdrawing the holder into daylight, you will find the picture in all its details. Without much delay, wash with water and return the plate to its rack, and then travel onwards for another view;—on arrival at home the plates can be re-washed, fixed, and varnished.

Whoever tries this simple instrument, will, I am sure, be pleased, and I shall feel amply rewarded. WILLIAM CHURTON.

30, Barclay-street, New York,
Oct. 1st, 1858.

P.S. I much like the formula you give for new collodion, in No. 59.

Subscription List

FOR THE PURCHASE OF MR. POUNCY'S PROCESS OF PRINTING IN CARBON AND PIGMENTS.

	£	s.	d.
Total from former List	62	10	6
M. Harrison, Courbevoie, Paris	0	5	0
W. J. Harley, 36, John-street, Glasgow..	0	5	0
W. Bellicklethwaite, 64, Bridge-st., Man.	0	10	0
C. Stevenson, Cemetery Gate, Greenock.	0	5	0
C. Pope, Chapple, Ilminster	0	5	0
H. R. Rump, Wells, Norfolk	0	2	6
W. B. Osborne, Birmghm. Phot. Society	0	5	0
W. Howell, ,, ,, ,,	0	5	0
T. Morris, ,, ,, ,,	0	5	0
— Whitlock, ,, ,, ,,	0	5	0
— Hart, ,, ,, ,,	0	2	6
— Holyoake, ,, ,, ,,	0	2	6
— Haines, ,, ,, ,,	0	2	6
J. Ball, ,, ,, ,,	0	2	6
— Branthwaite, ,, ,, ,,	0	2	6
L. Clagson, Short-hill, Nottingham ..	0	5	0
— Trovell, Nottingham	0	2	6
R. S. Hill, Tyne-street, North Shields ..	0	5	0
G. Turnbull, Barnhill, Perth	0	5	0
G. Giberne, Epsom	0	10	0
H. Wilson, 13, Kennington Oval, London	0	2	6
W. Anderson, jun., of Glentarkie, Kirkaldy	2	0	0
O. G. Rejlander, Wolverhampton	0	10	0
G. Bankart, 45, New Walk, Leicester ..	0	10	0
J. Dorrington, Manchester	0	5	0
J. Sidebotham, ,, ...	0	5	0
J. B. Dancer, ,, ...	0	5	0
T. Barth, Great Horton, Bradford	0	2	6
J. Duncan, M.D., Edinburgh	0	10	0
A. F. Adam, W.S., Edinburgh	0	10	0
R. Elliott, Pensher Iron Works, Durham	0	5	0
T. Taylor, Wrest Park, Ampthill	0	2	6
H. Haines, 82, Grand Parade, Cork ..	0	5	0
D Johnson, Northgate, Blackburn ..	0	10	6
J. Bailey, Darlington..	0	5	0
W. Salkeld, ,, C.E.	0	5	0
G. White, Scarborough	0	5	0
J. Mayer, Dale Hall, Longport, Staffordsh.	0	5	0
G. Sadler, Bute-street, Cardiff	0	5	0
Total to Nov. 9th............	£74	11	0

—If Subscribers will now be good enough to forward their subscription to Mr. Jno. Pouncy, High West Street, Dorchester, he will at once send them the printed particulars of his process, for their sole use, and not for publication until the £100 has been made up. [Ed. P. N.]

TOTAL DESTRUCTION OF Mr. SUTTON'S LABORATORY BY FIRE.

[*Extract from Johnson's Weekly Advertiser.*]

"Fire at St. Brelade's Bay.—We regret to state that a destructive fire took place on Wednesday evening last, October 27th, at the premises of Thos. Sutton, Esq., Editor of *Photographic Notes*, &c., &c. It appears that Mr. Sutton had been employing a workman to make some alterations in his laboratory, which adjoins his dwelling-house; when, on re-arranging some bottles containing ether, one of them became accidentally broken, the contents of which went streaming among vessels containing alcohol and other chemicals, causing gases to be evolved, of a highly inflammable nature; these shortly became ignited, and in a few minutes the contents of the building, consisting principally of chemicals used for photographic purposes, were one vivid mass of fire. Mr. Sutton immediately beat a retreat from the interior of the place, and with great presence mind proceeded to close the windows, doors and other apertures, in the hope of smothering the flames; and in the meantime despatched his servants to alarm the neighbours and claim their assistance. For nearly an hour the fire was kept at bay by the efforts of Mr. Sutton, his son, and another person, in the manner above mentioned. But at length a terrific explosion took place, which blew off the roof, sending the windows and all the fragile articles into thousands of fragments; the door also, which was being held closed by Mr. Sutton and others, was blown to a distance of several yards, carrying with it Mr. Sutton and his intrepid assistants. In the meantime several of the neighbours had arrived, who, by dint of great exertion and a plentiful supply of water, succeeded in extinguishing the fire before it had extended farther than one of the bedrooms, the contents of which were much injured. It is a positive miracle that the whole of the dwelling-house and contents were not destroyed. We are sorry to state, that in addition to being bruised and burnt to some extent, Mr. Sutton will sustain a loss of nearly £200. Several valuable cameras, and other apparatus connected with photography, with which so many important experiments have been made, together with a quantity of expensive chemicals, were swept away, and without the least chance of recompense, as the property was unfortunately uninsured."

[*Extract from the Jersey Independent.*]

"On Wednesday evening, October 27th, a fire took place at St. Brelade, under peculiar circumstances. Mr. Sutton had recently built, detached from the dwelling-house, a small laboratory, wherein to deposit spirits of wine, ether, &c. On his return from a dinner party, Mr. Sutton went into his laboratory to arrange the bottles containing the inflammatory chemicals. By some accident a bottle of ether broke, and that liquid ascending to the lamp, which that gentleman held in his hand, the whole of the ether was instantly in a flame, and bang went bottle after bottle. Mr. Sutton rushed out of the room and the neighbours being aroused proceeded to his assistance, closed the doors and windows, and with wet carpets and blankets succeeded in confining the fire to the room. After nearly an hour's constant work to keep the blankets wet, a loud report was heard; the roof ascended to a considerable height, the doors were torn down, and Mr. Sutton and his servant were thrown some distance amongst the furze. Fortunately, they escaped unhurt, with the exception of a few scratches and bruises. The laboratory, which is totally destroyed, contained upwards of a £100 worth of

ether, spirits of wine, &c., none of which was insured. There was also a quantity of gun-cotton, which accounts for the force of the explosion."

—The account contained in the above extracts from local papers is as correct as newspaper stories are; that is to say, it is true in the main. No worse injuries have been sustained than a few slight burns, but the loss of valuable apparatus, &c., is considerable. However, the laboratory is now roofed and floored again, and will soon be in good order for ordinary photographic operations. We trust our readers will take warning by what has occurred. Collodion and gun-cotton are dangerous substances, and should not be meddled with by candle-light; and in all cases ether and alcohol should be kept in a detached cellar.

[Ed. P. N.]

☞ *The whole of our Correspondence must be deferred until next number.*

Photographic Notes.

DECEMBER 1, 1858.

ANY of our readers can now, by enclosing to Mr. Pouncy a subscription towards the purchase of his process for publication, obtain from him by return of post a printed paper describing the full particulars of his manipulation. Most of the Subscribers have, we believe, paid their subscription and received this paper, but the £100 have not yet been made up, and until that sum has been realized, the paper must be considered as strictly private, and intended for the sole use of the Subscriber. As soon, however, as the above sum has been subscribed, the particulars contained in that paper will be published in this Journal and given to the public. Already then a great number of photographers, and among them the highest personages in the realm, and the Secretaries and leading members of the Photographic Societies of Scotland, Birmingham, and Manchester, are in possession of a simple and economical method of printing positive proofs in Carbon by a process which has been brought to the same perfection as any other photographic process, by the persevering industry of a man who well deserves to be rewarded for the great benefit he has conferred on Photography. And now that so many skilful operators are in possession of the means of Printing in Carbon, we hope soon to see the process extended to a variety of beautiful pigments of ascertained permanency, and tinted papers employed, so that prints may shortly be produced by the new method which are as superior in artistic beauty to those printed by the process now commonly employed as they are superior to them in permanency. And since the end of the present year is approaching, and we are beginning to collect materials for an article in our concluding number which is to contain a *résumé* of what has been done in photography in 1858, it is a matter of congratulation to us to find that the most important step which has been taken is due to one of our own Subscribers, and to the working out of a hint given by ourselves in the first number for the year. The *Notes* have therefore not gone forth in vain, and the principal photographic event of the year, viz., direct Printing in Carbon, is an accomplished, and, to some extent, a published process, through the means of this Journal.

The paper which Mr. Pouncy has printed and forwarded to Subscribers contains full information with respect to the manipulation of the process. His chief difficulty has been to find a suitable paper, as the vigor of the print depends greatly upon the paper. He has had a few reams manufactured of the kind which answers best, and this is so thick that the prints do not require to be mounted, for by attaching a margin to the negative the margin of the print is preserved, (absolutely white, for in Carbon-Printing the whites are preserved perfectly pure). This paper he will supply, in small quantities at first, to Subscribers, at cost price, viz., 2s. for twelve sheets 15 × 12. Being by trade a painter, he will also supply the other materials, so that Subscribers need not be inconvenienced by any delay in procuring the proper materials for the process; and we can assure them, from our own experience and knowledge of it, that they will encounter no difficulties, but succeed at once; for Carbon-Printing is of all photographic processes the most simple.

Since very few specimens have been exhibited lately, we shall take the liberty of mentioning that Mr. Kinnear, Secretary to the Photographic Society of Scotland, after having received some Carbon prints from Mr. Pouncy a few days ago, wrote us the following letter:—

"DEAR SIR,—Mr. Pouncy has sent me some specimens of his Printing in Carbon. I think the process gives good promise, and therefore enclose half-a-guinea, which please add to the Pouncy fund.

"C. G. H. KINNEAR.

"Edinburgh, Nov. 18."

We would also observe that those gentlemen who have subscribed most generously to the Pouncy fund, have, in every case, including His Royal Highness the Prince Consort, previously seen specimens of Mr. Pouncy's process. These remarks are simply made to meet the objection that no specimens have been lately exhibited. We would also add that Mr. Pouncy, a few days ago, wrote to us to advertise for him a Carbon print for sale, but we dissuaded him from taking this step, for a reason now to be explained. It will be remembered that in 1855 M. Poitevin took out a patent for Photo-Lithography, and also for printing in pigments, and that this patent includes vaguely the process of Mr. Pouncy, so that, although we firmly believe that M. Poitevin's patent would not be considered valid by a jury in the event of his attempting to enforce it, yet the sale of Carbon prints just at present might possibly involve Mr. Pouncy in a law-suit with M. Poitevin. Our reasons for supposing M. Poitevin's patent for Carbon-Printing mere waste paper are these:—A patent, in order to be valid, must contain such full particulars of the process that a commonly skilful workman may at once by

following the directions therein contained, produce the article described, and unless these full particulars *are* given the patent is worth nothing. A patent is a monopoly granted by Government to the patentee, not for the mere fee paid at the Patent-Office, but on the condition that the full particulars of the process patented are given to the public; so that while the patentee has for a certain term the monopoly of manufacturing the article, the public have the *knowledge* of how it is done; a patent would otherwise be a very one-sided transaction. Now, the patent of M. Poitevin does not include such full particulars of Carbon-Printing as that any photographer could at once produce a Carbon print;—and besides, in its vague generality, it includes a process published by Mr. Mungo Ponton in 1838, so that it might be set aside on these grounds. Should therefore M. Poitevin attempt to enforce in England his patent for Carbon-Printing, which nobody had heard of until we raked it up in June last from its obscurity, we are perfectly sure that a jury would decide against him. As for the patent of M. Beauregard, that expressly states that Carbon prints cannot be obtained by the very process which Mr. Pouncy employs. It is a serious evil that patents should be so frequently granted without due consideration on the part of the authorities. However, Mr. Pouncy does not appear to be afraid of any patents, for he has disregarded our advice, and his advertisement is inserted. Those therefore who wish to see a Carbon print can now obtain one by purchase.

While on the subject of patents, we find that in February last, M. Niepce de St. Victor patented in England his process of Uranium Printing, but the patent was not completed, probably because he found that his process had been already published in this Journal in a communication from Mr. Burnett. We give M. Niepce de St. Victor's Specification in *extenso*, at page 278, thinking it likely to interest our readers.

The Collodionized-Paper Process is one well deserving the attention of photographic tourists, and we submit to our readers the following method of working the process, as likely to interest them; acknowledging at the same time our obligations to M. Corbin, and the Rev. Wm. Law, for the hints which we have taken from their communications on this subject, published in back numbers of the *Notes*.

To take a negative upon collodionized waxed-paper, proceed thus :—

Take a sheet of Canson, or Marion, or Saxe paper, free from spots and defects, and before waxing it submit it to either of the following modes of treatment :—

(*a*). Immerse it for half-an-hour in a dilute solution of muriatic acid, say one part of acid to three of water. This removes any metallic spots, and softens the size so that the paper imbibes the wax uniformly and without granulation, which is a very important point. Then wash it in several changes of water and hang it up to dry. In doing this be very careful, for the paper is extremely tender.

(*b*). Soak the paper in boiling water, in order to soften the size and enable it to take the wax without showing granulation. Dry it as before, very carefully.

The next operation is to wax and iron the paper, which is so well-known that it need not be described. Waxed-paper, prepared in the above manner, should be compared with the same paper, waxed, without being submitted to either of the operations (*a*) or (*b*);—the importance of these operations will then be perceived, because the waxed paper thus treated is free from grain and irregularities, while the common waxed paper is very granular, and quite unfit for photographic purposes. Let us not be mistaken in making this assertion; we mean to say distinctly that waxed paper prepared in the usual way is totally unfit for photographic purposes, and that a *first-rate* negative never has been, and never can be taken upon such paper.

Having thus prepared the waxed-paper, it must be cut about half-an-inch smaller every way than the glass plate which fits the dark slide used in the collodion process. Then, brush it over on both sides with absolute alcohol, and apply it immediately to the glass plate, pressing it into close contact by means of the camel's-hair brush. The paper adheres perfectly to the glass, and lies quite flat, but the edges require to be well wetted with the alcohol, and pressed closely to the glass.

The collodion is then to be poured upon the paper precisely in the same way as upon a glass plate. It flows beautifully upon the alcoholized surface of the paper. The entire plate must be coated up to the edges of the glass; the outer border of collodion then protects the back of the paper from the action of the chemicals, and fastens it firmly to the glass.

The plate is then dipped into the nitrate bath, exposed in the camera, developed with pyro-gallic acid or proto-sulphate of iron in the usual way, fixed with cyanide or hypo, and washed well in water. After which the

paper negative may be removed from the plate and immersed in a dish of water to soak for some time; then dried, and ironed again at any future time.

The time of exposure is about the same as in the ordinary process, perhaps a little less, but certainly not longer. The picture exists entirely in the collodion film, and not at all in the waxed paper; for if, while the film is still wet after the development, it be rubbed with the finger, the picture comes off entirely, leaving the waxed-paper perfectly clean. This is a very important feature of the process, because all the delicacy and beauty and sensitiveness of the collodion process is preserved, without incurring any of the disadvantages of the paper process, such as insensitiveness and grain.

When the negative is removed from the dish in which it is finally washed it must be hung up to dry, and when dry it will be found that the collodion adheres so perfectly to the paper that it cannot possibly be removed by any kind of rough treatment, such as scratching with the nail, &c. It is then like a waxed-paper negative in which the picture is entirely superficial and free from all the defects due to the absorption of the chemicals by the paper; and the back of it is perfectly clean. Prints from such a negative are very fine, and for bold artistic subjects of large size quite equal to those from glass plates; the difference between prints from paper beautifully waxed and glass being only perceived in small delicate subjects.

Having thus described a very simple process, with which any of our readers may succeed at once, we will endeavour to point out some of its advantages over the paper and glass processes at present employed by tourists.

For Stereoscopic, or very small pictures, the process offers no advantages over wet collodion, because in such subjects the utmost possible delicacy of detail is required, and nothing should be sacrificed to convenience; but for large bold subjects the process would be quite suitable, and its principal merit is that paper negatives are more portable than glass, and less liable to injury.

For the sake of example, let us take the case of one of our readers starting next summer for a photographic tour in Germany and Switzerland, and desirous of taking pictures 12 × 10. Say that he is familiar with the Wet Collodion Process and anxious to take, in addition to such subjects as might be taken upon paper, others which could not, such as skies, instantaneous pictures, atmospheric effects, interiors, and so forth. Well, by employing glass, he would have to encumber himself with such a load of plates that a trip of a few weeks would involve serious expense and trouble; but by employing collodionized paper, only a few glass plates would be required, while the manipulation of the process would remain the same as before. Again, there is a great advantage to the tourist in any process which enables him to excite and develop his pictures at the inn where he happens to be staying, instead of being obliged to excite and develop in a dark tent or van; now the collodionized paper retains its moisture much longer than collodionized glass, and this would allow an hour or two to elapse between exciting and developing.

Suppose, for instance, that a proper plate-box were provided for holding damp plates, and that a piece of damp thick blotting paper were stuck to the back of each plate, so as to be immediately opposite and quite close to the film upon the adjacent plate, and that such a box could be closed air-tight, and carried with the plates horizontal, film side downwards;—the collodionized papers would then certainly retain their moisture for several hours, and they might be excited in the morning and developed in the evening without any loss of sensitiveness or risk of failure. The tourist might then work the Wet Collodion Process with all the advantages and conveniences of paper,—and his negatives might be packed in a portfolio, and only half-a-dozen glass plates and a single plate-box be required. Putting all these advantages together, we would strongly advise our readers to experiment with this process during the winter months, so as to be *au fait* with it before the next season for out-of-door operations. The damp-plate box might be made of wood lined with gutta-percha, or coated with several applications of water-glass; or it might be made of japanned tin, and wrapped round externally with a damp towel and enclosed in a cover of Mackintosh cloth.

We give the following extract from Mr. Seely's American Journal; the article is headed "A new and beautiful picture":—

"In preparing this picture for the coloring, place before your camera a common negative on glass. Allow the rays of light transmitted through this negative to fall upon a sensitive collodion surface on glass, and thus you get a positive upon it, with, of course, the light and shades reversed. When this picture is partially dry, or sufficiently so to become what might be termed damp, then pour over it some common spirit-varnish, to which a little acetic acid has been added. Quickly drain this off, and when it has dried sufficiently to become

"tacky," lay carefully upon it a piece of paper, slightly damped. With a piece of cotton, press this paper down until every portion of it comes in contact with the varnish, and a perfect adherence has taken place. Now allow the paper to dry, when, by careful management, the paper can be lifted off the glass, and thus you have a transference of the collodion upon the paper. Now render this paper transparent,—or rather translucent,—by the use of Canada balsam, dissolved in spirits of turpentine. Allow this to dry, when the picture is ready for coloring. This latter process is the simplest of all, and can be done by the merest tyro. All that is necessary is to color the picture upon the back with common oil-paints, such as are used by artists, of course placing upon the face the proper flesh color, &c. It would be superfluous to mention that the shades are those belonging to the photograph, and that they exhibit themselves in all the delicacy and detail characteristic of the ambrotype. This picture, in fact, closely resembles those very fine and elaborate miniatures, done in oil, by the first-class Parisian artists, except that it is superior to any painting done by man, in all that is delicate, beautiful, and perfect."

The Editor of the "Photographic News" has made some remarks in his last Number respecting what he calls our depreciatory criticism of Mr. Fox Talbot's new process. If he will be good enough to read our article again he will see that he has mistaken our argument. The process would no doubt render the words "Secretan," &c., perfectly well,—but there are *lines;* will it give continuity and modulation of shade without exhibiting grain? We think not. Nevertheless the specimens we have seen, and for which we have to thank our contemporary, are very good, and we feel sure that the process may, in its present state, be applied to some useful purposes. Mr. Fox Talbot has kindly offered to send us a number of specimens of his process, and we shall no doubt have something to say about them in our next Number.

The French Photographic Society held the first meeting of the Winter Session on Oct. 29.

We observe with much pleasure that the Architectural Photographic Association have got over their printing difficulties, and are about to open a second Exhibition, and make a second essay at getting guinea subscriptions for a set of Architectural photographs. The subjects issued to Subscribers on the recent occasion are, without exception, of the highest merit, and we strongly advise our readers to join this very useful Association; but we must express our hope that the next issue of prints will be in Carbon, and not by the old process.

Our correspondent "N," whose letter will be found at page 283, sends us, from time to time, the best specimens we have seen of albumenized printing. In these prints the whites of the paper are preserved absolutely pure, while the blacks have great vigor. It is worthy of remark that the paper he uses is Hollingworth's thin paper, obtained from Mr. Sandford, and the same which we have for some time recommended for negatives. This paper is sized with alum, and has a slightly acid reaction, which preserves the purity of the whites both in positives and negatives. The reader should consult the former communications of "N," in back numbers of the *Notes*, they have considerable practical interest.

We have to thank numerous correspondents for the kind sympathy they offer us on the subject of our late mishap, but we should have said nothing about it, except as a warning to others. The laboratory is now rebuilt and again in working order. We were certainly mercifully preserved in an accident which might have terminated very tragically.

ON A NEW, CHEAP, AND PERMANENT PROCESS IN PHOTOGRAPHY.

BY MR. W. M'CRAW.

[*Paper read before the British Association at Leeds.*]

"I now set myself to repeat in writing the mode I use for producing the specimens which attracted your notice to-day, of permanent photographic prints, produced without either silver, gold, or the noxious hypo-sulphite of soda, I need not expatiate to you upon the advantages of such a process. It is, indeed, felt to be the great photographic desideratum wherever photography is practised—and that is nearly all over the world—particularly by the conscientious photographer and the considerate collector of photographs. The labours of the Committee appointed by the Photographic Society of London, to inquire into the cause of the fading of photographs, after a lapse of two years, have only amounted to this: that photographs of a certain kind have all faded: and that some of those of the kind that have stood best have unaccountably faded,—the sad presumption being, that in time all photographs produced in the usual way, by the means of chloride of silver, and fixed (as it is called) by hypo-sulphite of soda, will perish. These considerations, and the fact of a prize being offered by a French nobleman for the discovery of a process for printing photographs in Carbon, set me to experiment in that direction. But my experiments with carbon and various pigments led me to think that no material applied mechanically, or that could not be made to take the shape of a dye or chemical solution, would ever give results with the exquisite half-tints of the present beautiful but perishable process. The photographic properties of bi-chromate of potass were pointed out by Mungo Ponton twenty years ago, giving photographs of a pale tawny color. A piece of paper is washed

over with the saturated solution of the bi-chromate, and when dried in the dark is of a bright yellow color, and very sensitive to light. If a negative photograph, or a piece of lace or a leaf, be placed over the prepared paper, and put in sunshine, in a few minutes a perfect impression of the object is obtained. The light darkens the color of the bi-chromate, and renders it insoluble in water, while the yellow color washes out from the parts protected from the light by the lace or leaf, or negative photograph, as the case may be. But pictures of this kind have little or no practical value; for although the lights are good enough, the deep black shadows are only represented by a tawny shade. Some eighteen months ago a process was patented for deepening these photographs by treating them with gallic acid and a salt of iron, which went by the name of 'Sella's process.' I tried this process at the time according to the specification of the patent, but failed to make one satisfactory specimen. They wanted everything that a good photograph should have,—pure lights, clear half-tints, and deep shadows,—and as I found that others had not been more successful, I abandoned my experiments. But in the course of further experiments, a year afterwards, with carbon, I was struck with the fact that a drop of a solution of bi-chromate of potass allowed to fall on a piece of white paper and afterwards dried and exposed to the sun, when washed with a solution of proto-sulphate of iron, and then with gallic acid, while the spot became perfectly black, the surrounding white paper was unaffected by the liquids. Knowing the photographic properties of the bi-chromate already described, I believed that this might be the foundation of a good photographic process; and that if the bi-chromate could be kept from penetrating the pores of the paper, by being kept on its surface, the defects of Sella's process might be avoided. With this view, I began by filling the pores of the paper with albumen, and then to render it insoluble, immersing the paper in ether. This, however, did not answer. But as it would be tedious to detail all the pains I took to discover what would not do, and to find in what proportions and in what order the right materials could be best applied, I will briefly give the formula which I have adopted, and by which the specimens alluded to were produced:—First, take the white of eggs, and add 25 per cent. of a saturated solution of common salt (to be well beat up, and allowed to subside); float the paper on the albumen for thirty seconds, and hang up to dry. Secondly, make a saturated solution of bi-chromate of potass, to which has been added 25 per cent. of Beaufoy's acetic acid. Float the paper on this solution for an instant, and when dry it is fit for use. This must be done in the dark room. Thirdly,—expose under a negative, in the pressure-frame, in the ordinary manner, until the picture is sufficiently printed in all its details, but not over-printed, as is usual with the old process. This requires not more than half the ordinary time. Fourthly,—Immerse the pictures in a vessel of water in the darkened room,—the undecomposed bi-chromate and albumen then readily leave the lights and half-tints of the picture. Change the water frequently, until it comes from the prints pure and clear. Fifthly,—Immerse the picture now in a saturated solution of proto-sulphate of iron in cold water, for five minutes, and again rinse well in water. Sixthly,—Immerse the pictures again in a saturated solution of gallic acid, in cold water, and the color will immediately begin to change to a fine purple-black. Allow the pictures to remain in this until the deep shadows show no appearance of the yellow bi-chromate; repeat the rinsing. Seventhly,—Immerse, finally, in the following mixture:—Pyro-gallic acid, 2-grs.; water, 1-oz.; Beaufoy's acetic acid, 1-oz.; saturated solution of acetate of lead, 2-drms. This mixture brightens up the pictures marvellously, restoring the lights that may have been partially lost in the previous parts of the process, deepening the shadows and bringing out the details; rinse, finally, in water, and the pictures are complete when dried and mounted. The advantages of this process may be briefly stated as follows:—First, as to its economy. Bi-chromate of potass, at 2d. per ounce is substituted for nitrate of silver at 5s. per ounce. Secondly, photographs in this way can be produced with greater rapidity than by the old mode. Thirdly, the pictures being composed of the same materials which form the constituent parts of writing ink, it may be fairly inferred that they will last as long as the paper upon which they are printed."

A beautiful photograph of Sir Walter Scott's monument, obtained by this process, was exhibited in the section.

—The above process only differs from Sella's, published in *Notes*, No. 30, in first albumenizing the paper, and in the final application of pyro-gallic acid and acetate of lead. Mr. McCraw's prints are exceedingly sharp, and good in the half-tones, but feeble and bad in color. The shadows are glazed,—the lights not. [Ed. P. N.]

ELECTRICITY AND PHOTOGRAPHY.

BY P. C. VANDERWEYDE, M.D.

[*From Seely's American Journal of Photography*]

"I learn from the foreign journals, that experiments are extensively made to produce photographs by means of Carbon, in the place of silver.

"On hearing about this process for the first time, the idea struck me that, as in 1790, *Galvani* had discovered the kind of electricity bearing his name, and *Volta* had invented the column, also bearing his name, silver was considered the best, but also the most expensive material; however, copper could be used, and was used almost everywhere, till *Bunsen* discovered, about 1840, that Carbon was at least as good, if not better, than anything else.

"If we now consider that silver or Carbon in the galvanic battery, are the electro-negative elements (zinc being usually the positive,) and that the reason why Carbon may be substituted is, that their chemical affinity in the battery is the same, so I was struck with a singular similarity in the case

of photography. Twenty years after the possibility of photography on silver had been discovered, the Carbon takes its turn as a substitute for the expensive silver, just as it did in the galvanic battery fifty years after the discovery of galvanism.

"In the galvanic battery, *silver* or *carbon* are the negative elements, and in photography we can consider them so; in the galvanic battery they collect the electricity developed by the action of the acids on the zinc, (with or without mercury;) in photography they form the picture developed by the action of the light on the iodide, (also, with or without mercury).

"In some galvanic batteries the zinc may be amalgamated with mercury, even so in Daguerre's process, the silver is amalgamated with mercurial vapour, and in the collodion process, strengthened by bi-chloride of mercury.

"However, as the Carbon process is developed for the present, we must confess that Carbon does not exactly form a substitute for the silver,—that means that no iodides, bromides, or chlorides of carbon are used as sensitive to light; in chemistry, not much is known, till the present, of the two first compounds; the last, chloride of carbon, cannot be directly produced, as carbon does not unite directly with chlorine; but when chlorine is made to act on certain organic compounds, which are decomposed by it, the carbon being presented to it in the nascent state, combines with the chlorine. There are several chlorides of Carbon;—1st, bi-chloride of carbon, a white, solid, fusible and combustible body; 2nd, proto-chloride of carbon, a liquid boiling at 160°; 3rd, per-chloride of Carbon, a very fusible solid, boiling at 300°, combustible; none of these compounds were considered by chemists to possess any practical intent till the present time.

"It may be interesting to investigate the properties of the iodide and bromide of Carbon, and their adaptability to photographic purposes; that they may be sensitive to light in some way or other, may be concluded by analogy, as hydrogen, in many respects similar in chemical affinity to the Carbon, forms compounds with chlorine, iodine and bromine, exceedingly sensitive to light; chlorine and hydrogen mixed in the dark, unite with terrific explosion as soon as the least ray of sunlight strikes it—this is an old and well-known experiment.

"Daguerre made already the observation, that silver, plated on copper, was more sensitive than a single silver plate, and he attributed this to some electro-chemical action; later, it was found that silver, precipitated on a copper plate, from a solution of silver salt, by means of a galvanic battery, was much more sensitive than that prepared in the usual way, by stretching out large masses by means of machinery, and it is usually explained by saying that the silver is chemically purer, and for that reason more sensitive; this is undoubtedly true, but also it is certain that the molecular arrangement of the silver atoms, as it is obtained by means of precipitating by the galvanic battery, if undisturbed by the usual operations of plating by machinery, must produce a surface of a different kind, more fit to receive the impressions of the active rays of light, than common silver, where the molecular arrangement has been disturbed by the manipulations of the manufacturing process.

"Even as in the galvanic battery, copper has been substituted for silver, so has it been done in the Daguerreotype process. As these processes are almost unknown in this country, I will in another article describe them.

"All that seems to have been done till the present with the Carbon in photography, appears to be to have it finely, mechanically divided, and mixed in a solution of some salt that loses its solubility by the influence of light, and will retain the Carbon, therefore, in its impressed parts, and will not retain the Carbon where it has not received luminous impressions, by being immersed in a liquid to re-dissolve the salt.

"I wish to give the above only as a sample of the immense field yet to explore in photographic investigation; such considerations make us confident that this beautiful art, notwithstanding its wonderful and charming products, has not by any means attained its full development, and no wonder—it is not quite twenty years old. What will be added by the next twenty years? And what will photography be among posterity after two hundred years? No human mind can possibly form the faintest conception about its sublimity at that, for us, remote period.

"New York, Sept. 15, 1858."

SPECIFICATION.

URANIUM PRINTING.

No. 396.—PROVISIONAL SPECIFICATION, left by WILLIAM CLARK, *Engineer and Patent Agent*, at the Office of the Commissioners of Patents, with his Petition.—"Improvements in preparing Paper for, and in obtaining Photographic Proofs or Impressions. —*February 27th*, 1858.

"This process is based on the property that all bodies have of absorbing a greater or less quantity of light. This new process of photography, which

I call "photography by absorption of light," consists in taking a sheet of paper which has been kept in the dark during a certain number of days, and immersing the same in a solution of salt of uranium, (this salt has the property of absorbing a very large quantity of light,) but I prefer to use azotate of oxide of uranium. This latter is produced either in treating oxide of uranium with diluted azotic acid, or in dissolving in water crystals of azotate of oxide of uranium in proportions of about ten per cent. The sheet of paper must be impregnated with salt of oxide of uranium in a sufficient quantity, that its tint may be of a nice straw yellow color, and after it is dried it is to be kept in the obscurity mentioned. Other salts of uranium will answer the purpose, and which I substitute for the bi-chromate of potass usually employed in photography.

"When it is desired to operate with this sheet of paper, it is covered by a photographic negative impression or proof either on glass or on paper. This sheet is then exposed to the action of the sun for about a quarter-of-an-hour, and afterwards kept in the dark, the proof which covered it is withdrawn and the sheet is treated with a solution containing about six per cent. of azotate of silver. The operator then sees the appearance of a very distinct positive image of the chesnut colored tint of the ordinary proofs. In order to fix this image it suffices to immerse it in pure water which dissolves all that part of salt of oxide of uranium, which by reason of the dark parts of the negative proof have not received the action of light, after which the image or impression is fixed.

"If, after having well washed the proof with pure water, it is desired to transform it into a black tint, the said proof must be treated with a solution of commercial chloride of gold in proportions of about two-tenths of a per cent., and then washed again with pure water. All these operations do not require more than half-an-hour, after which the photographic image is entirely finished.

"The proof obtained with azotate of silver may also be transformed into a black tint by using the two following processes:—They consist in passing the sheet of paper after it has been impregnated with salt of oxide of uranium, and exposed to the sun, in a solution of bi-chloride of mercury, and in which it is left only a few minutes according to the length of time it is exhibited to the light, which time must be three times longer than in the first process above specified. After the proof has been washed in pure water, it is introduced in the solution of azotate of silver, and left in the same till the image is perfectly obtained with a black tint like ink; it is afterwards washed again with pure water, and then the proof is fixed. After the passage of the proof in the bi-chloride of mercury, the solution of azotate of silver may be replaced by a solution of chloride of gold, which latter will give the proof a blue-black tint or color.

"After the sheet of paper impregnated with salt of oxide of uranium has been exposed to the light, the image may be instantaneously obtained by treating the said sheet with a solution of commercial chloride of gold; in this case the proof has a very dark blue tint; it is at last washed with pure water, after which the proof or image is fixed.

"These photographic images being obtained, as before mentioned, with a salt of uranium, combined with a salt of gold, or of silver and of mercury, are capable of resisting and are not liable to be effaced by the energetic action of a boiling solution of cyanide of potassium; aqua-regia alone alters them.

"As no sulphur exists in these impressions or images in contra-distinction to those obtained with chloride of silver, it appears that such images will be much more stable than the photographs obtained by the ordinary processes, and that this new mode of obtaining positive proofs, which is very simple and very rapid, is the desideratum long sought for in photography.

"The solution of azotate of uranium may be replaced by a solution of tartaric acid, or of citric acid, or of oxalic acid, or of sulphate of alumina, or of citrate of iron, or of arsenious acid, or of neutral tartrate of potash, and of lactic acid, all the above substances having much the same property as the salt of uranium, but they will not produce an indelible impression, as does the salt of uranium.

"Negative proofs or impressions may be produced by placing in the camera-obscura a sheet of paper impregnated with salt of uranium, but, as this process is of long duration, it would serve only for obtaining views of inanimate objects. Very fine and beautiful negative proofs are obtained in the camera by putting on a sheet of glass a solution of azotate of uranium mixed with gelatine, and preferably in gum diluted. A salt of uranium, mixed with gelatine or gum, give to these matters the property of being insoluble, like the bi-chromate of potash, when these substances have been exposed to the light, which would allow of substituting them instead of the bi-chromate of potash in the processes of engraving on steel or of litho-photography on stone.

"Positive proofs on glass for the stereoscope may also be obtained by replacing the albumen by a coating of gum containing azotate of oxide of uranium, and in developing or producing the image either with chloride of gold or with azotate of silver. For attaining this result the subjection or exhibition to the light must be sufficiently long to allow the instantaneous development of the impressions or images, and in order that the gum shall have no time to dissolve where it is not acted on by the light.

"This process has the advantage of giving the proofs blue, red, black, or chesnut-colored tints, according to the combination of the salts of gold and of silver."

RECOLLECTIONS AND JOTTINGS OF A PHOTOGRAPHIC TOUR DURING 1858.

BY J. W. G. GUTCH, M.R.C.S.L.

You have so liberally given space in your *Notes* for my journeyings and wanderings in 1856-7, that I would fain crave a few more pages for those of '58, and the more so, as "the lines (in part at least), have fallen in pleasant places"; and what adds a still greater charm, on ground where as yet very few cameras have been planted,—I mean Cornwall;—from its far-away locality, and from

the railroad not having yet been completed, it has not been explored so much as many other inland counties. I had long wished to visit this part of England, before the days of Photography, and now being able to take back with me the reminiscence of the country I pass through, the interest is of course fourfold.

Eager to commence, I again began a little too early in the year—April—except for any buildings obscured by trees and foliage, when of course they are more easily attainable. Trees, too, although bare of leaves at that season of the year, are exceedingly beautiful, and in the markings of the thousand branches, show the wonderful working of the Photographic art.

My early labors this year were confined to Bristol and its neighbourhood. The older parts of Bristol offer some very beautiful photographic studies, the only difficulty being, the obtaining a *quiet* place for the camera: the window of a house near being oftentimes just too far, or too near; too much to the right, or too much too the left. I had heard so much praise bestowed upon the collodion made by Ponting, of Bristol, and that too by competent and reliable authorities, Mr. Llewellyn among the number, that being on the spot, I determined on giving it a fair trial, and I have no reason to regret the surmounting the many little difficulties I at first encountered.

In these Jottings it has been my wish to put down all my *experiences*, (if I may be allowed the expression) of the year, and therefore, at the risk of being deemed prolix, I shall, in this year's account, follow the same rule; my wish is to *benefit* those who will take the trouble to read these few lines, and not to puff or make any assertions that I cannot fully bear out by experience. I at first found that I failed in every picture with Ponting's collodion, and was told that I over-exposed. I soon found out, however, that in place of sometimes *minutes* (which in previous years, with Thomas's collodion, I was always obliged to do, and rarely under five), I must substitute *seconds:* and on bright days it has proved almost *instantaneous;* this rapidity of action, is, in my opinion, *invaluable*, enabling the operator to enliven all his pictures by the introduction of groups, nay, almost of moving figures, thus giving life and animation to the drawings, which they were sadly in want of before; and for portraitizing it is almost a *sine qua non.* With Thomas's I had always great difficulty; this year, with Ponting's, I have done some of the best groups I have ever yet taken, attributable, in my opinion, to the rapidity and sensitiveness of the collodion; another great advantage and convenience is its keeping quality, *when mixed or iodized;* indeed it appears to improve rather than deteriorate. It remains for months perfectly *colorless*, whilst the other collodion changes its condition almost daily, and therefore always occasions uncertain results. I again, for the third season, used my Archer's camera, but soon found out that the nitrate-bath holder, (described in my first paper) which I could use with impunity with Thomas's collodion, was very destructive with Ponting's, the marine glue with which the back and front lining of glass is cemented, and the benzole or gutta-percha cementing of the water-tight lid, so destroyed and decomposed the nitrate-bath solution used for exciting Ponting's collodion, that invariably getting fruitless results and wretched negatives, I had almost given it up in despair, (condemning, of course, the new collodion), when by substituting a porcelain bath for the wooden one, all went right, and has continued so to the present time. I now carry my nitrate bath (16 ozs.) in a bottle, protected by a tight-fitting cover of black American cloth sewn round it, and into this I empty the nitrate solution each time on finishing the view. It thus keeps clean, and is not so liable to be wasted as before; whereas the so-called water-tight bath often proved just the reverse, destruction of property and disappointment at the end of one's journey ensuing. The bath for Ponting's collodion is made as if for Thomas's, the formula for which I gave in my first paper. The only other variation I have made in this year's proceedings is the substitution of citric for acetic acid in the developer, which I find answers admirably. I now always carry in my pocket-book a dozen or more 4-grain packets of pyro-gallic acid, ready weighed, and an equal number of packets containing each 3-grs. of citric acid; this, with about a drachm-and-a-half to two drachms of spirits of wine, and four ounces of water, makes a capital and serviceable mixture, which I have never once had occasion to find fault with; it is cheaper, more portable, and oftentimes more readily obtained than glacial acetic acid, especially in remote places, and far away from home or large towns. I have this year entirely abandoned the use of cyanide of potassium, and returned to the hypo-sulphite for clearing my negatives of the yellow iodide; and, although slower, it has many advantages; besides, there is less risk of spoiling the negative, or poisoning one's self or neighbour, —for in lodgings, during a summer's ramble, one's room (especially that of a photographer) is pretty closely examined, and many of the mysterious pieces of machinery handled and criticised, and possibly bottles tested and tasted, the old maxim of "touch not,—taste not" being quite disregarded. In printing, (I feel I am here touching on delicate ground), I have this year entirely abandoned the *floating* plan, for two reasons, viz., finding the old-fashioned method of brushing the paper over with the ammonia-nitrate solution much more expeditious and economical, and I may add, much more uniform in its results. Secondly,—I find Marion's plain extra thick (still thin) *plain* paper, *very* good in every respect, but it will not keep long after being excited; if required to be kept a day or two more then I employ Towgood's, which also answers very well, and is of very uniform texture and moderate in price, though I am always obliged to re-salt it, it being, I conclude, salted for the *floating process.* I have this year (and I now write in the month of September) taken nearly 3000 copies by the ammonia-nitrate process, thus I may be allowed to speak with confidence on the subject. Truly delighted I shall be when the fixing part of the operation is changed, and the abandonment of the hypo-sulphite solution found to be practicable, but I fear the day has not yet arrived for this most desirable result. In every other respect I have proceeded as in former years, and

the results tell the tale; moreover, the approbation bestowed upon them by the public, afford me quite sufficient encouragement to persevere in the same course that I have begun.

Some of the older parts of Bristol, such as the Castle Bank, some houses in Maryport-street, Redcliffe-street, and Temple-street, are to be easily obtained, and I readily transferred them to my collection. These old houses are fast disappearing beneath the ruthless hand of modern improvement, and are of course all the more valuable and interesting to obtain photographically. The fine Cathedral, from its northern aspect, is almost *un*attainable, except very early in the morning; the gateway in Alley-green and its very beautiful Saxon arch, is quite worth any trouble bestowed upon it, and is well lighted up. St. Mary, Redcliffe, affords some beautiful studies, and there is no difficulty in getting points of view. I would particularly mention one as being a very good *general* view of this most beautiful piece of Ecclesiastial architecture, viz., from a gin shop, on Redcliffe Hill, where there is a large bow window and an excellent view, and the proprietor is very civil and obliging. The scenery of Clifton and the Hot Wells is too well-known to dwell upon, and presents endless points of great beauty and interest. To geologically-inclined photographers, I would mention some beautiful sketches of rock on the Hot Wells road, and one specially curious instance of contacted stratification at the bottom of the new road leading up to the Downs from the Hot Wells road; it photographs beautifully. Near Bristol, and within an easy ride, there are many points of great interest. One, little known, and quite deserving a visit with the camera, is Stanton Drew, a very large and perfect Druidical circle of huge stones, and although difficult to get into one picture (the circle being so wide), still, with a little pains-taking, I was able to manage to preserve a very good idea of this most curious relic of by-gone times—days so far gone I fear as to envelop these remains in mystery, never to be explained;—were they places of worship, or were they places of judicature,—or both,—who is to determine?

Clevedon Court, Clevedon; the residence of Sir A. Elton, is a very fine specimen of the old Elizabethan style of Architecture, and well worth a visit. Some of the Somersetshire churches too are fine specimens of architecture. I may name Cerington, the birthplace of Locke, whose humble house, where he first drew breath, (a public-house at that time), still stands and abuts upon the churchyard; here, too, is the last resting-place of Hannah More. Yatton Church and its unfinished tower, and Steeple Banwell and Lympsham churches are all quite worth taking. The Cliffs of Cheddar will afford several days instructive work, though there is much difficulty, from their height, in photographically giving any idea of their rare beauty; the adjuncts too, in a small picture, are wanting, viz., the accessory scenery that is seen in nature; an isolated rock is ofttimes doubly beautiful and picturesque when viewed as in nature, joined to sea, or some other picturesque bit of headland scenery, a charm it looses when pourtrayed as an isolated bit.

Glastonbury and Wells, being now so easily accessible by railway, offered too many temptations not to visit them, and I was amply repaid. The front view of Wells Cathedral should be photographed *near* and in *detail* to do justice to its great beauty; a general, and perhaps the best view of the whole mass of building presented by this noble Cathedral, is easily obtainable from the Bishop's *kitchen* garden, to which access is readily given; in the garden in front of the Palace I obtained three very nice views, one of the Palace and two of the remains of the old Banquetting Hall; with the latter I must not forget to mention a splendid specimen, (in full flower when there in May), of the *Paulonia Imperialis*, a tree imported from Japan, and which has rarely been known to blossom in this country; it has a deep blue blossom, very much like the *Glauxinia*, and smelling sweeter than any violet; the leaves are twice as large as those of the Plane or Julep tree, thus possessing extraordinary attractions as an ornament to a large flower garden. At Glastonbury I found a fellow-labourer hard at work, having turned the crypt of St. Joseph's Chapel into a dark room; I, with my Archer's camera, laughed at him, and in two hours left with six good negatives, achieved without mishap or fatigue, and with less running about and trouble than he was subjected to in the production of one. He envied my success as others have done before him; he saw the remedy and the cause of it, and therefore I consider gained by my visit that day. What the reason is that Archer's camera is not *universally* adopted I cannot divine; try it once and you will never wish to use any other. But how hard it is to combat with prejudice.

Another month at Weston-super-Mare was spent chiefly in taking various churches and buildings for special purposes, but which I shall here pass over, as they present no points of interest to the general reader. The *locale* I was so anxious to arrive at has occupied me busily for nearly three weeks; I mean the part of Cornwall immediately around Penzance; but this must form the subject of my next contribution.

*** *Communications to be addressed to the Editor, St. Brelade's Bay, Jersey.*

CORRESPONDENCE.

ARCHER'S CAMERA.

To the Editor of Photographic Notes.

Dear Sir,—I saw, some weeks ago, in the "Photographic News," an enquiry which struck me as one of great interest and utility, and to which I would fain have seen more answers than have appeared, viz., as to *the smallest quantity of water that can be used in a day's work abroad, and in a locality where it is unattainable.* During a sojourn at Lynmouth two years ago, I was much amused at seeing a two-gallon jar on the top of a fly, (a heavy load for even a blue-bottle), placed there as the consumption for the day's requirement; and I have many times since witnessed the distress

occasioned by the paucity, or even total want, of this necessary adjunct for photographic field-work. I replied to the letter in the "Photographic News," and at the risk of appearing a bore, and always seeming to harp on the same subject, viz., the signal advantages that an Archer's camera offers to the photographer, I would venture to occupy a few lines again to reiterate what I have before advanced. *Fourteen ounces* of water I find,—and have done now for three years,—quite sufficient for a day's work, and to enable me *securely* to bring home eight negatives $8\frac{1}{2} \times 6\frac{1}{2}$, and as many stereoscopic negatives of the usual size. It is certainly the most economical allowance I have ever heard of, *but it is enough*, as proved by nearly 800 good negatives, copies from which are at the service of any one choosing to require them. The form of bath is fully and minutely described in the number of your *Notes* where I described the construction of the camera. It is of wood, strongly screwed and cemented together with marine glue. It is *wedge*-shaped, thinner at the bottom than the top, and in its place in the bag in the floor of the camera, is kept in a slanting position, the bottom of the flat side leaning *towards* the operator; the dimensions *ex*ternally are as follows:—*without* the lid it is 11-ins. high, $8\frac{1}{2}$-ins. broad, 1-in. thick at the top, and $\frac{1}{2}$-in. thick at the bottom; with the lid, which is clamped on with screws and two brass clamps, and has three layers of sheet India rubber to make it water-tight, it is $11\frac{1}{2}$-ins. high. *In*ternally it is $7\frac{1}{2}$-ins. broad, $8\frac{3}{4}$-ins. high, and $\frac{3}{4}$-in. thick. The dipper is of wood, just long enough for the end to flush with the top to allow of the lid being screwed on, and is $10\frac{1}{2}$-ins. high, 4-ins. wide at top, and at the bottom is a bevelled cross-piece, 7-ins. broad, to carry the plate bevelled *in*. By keeping this pressed against the side of the bath when putting in or taking out the plate, it is impossible, with ordinary care, to rub or injure the film,—the accident has never occurred to me. The bath, when charged with water, and having the dipper in, and *allowing* for the displacement caused by the immersion of the *glass plate*, holds 14-ozs. of *common* water. Mr. Archer always recommended the addition of a little common salt, but I have never used it, and do not find the want of it. Of course, after a day's work, I find the water yellow and discolored, but still it answers well, and efficiently serves the required purpose. Immediately after developing the plate in the ordinary way inside the camera, and by the aid of the yellow blind at the top of the camera, and I am satisfied that the image is as perfect as I require, I plunge the negative gently into the water bath, and then open the end of my camera to daylight. I leave the negative for a minute or so in the water bath, and then bring it out into open daylight, or sunlight, and having satisfied myself that it is what I wanted, put it in the plate-box. I do not mean to assert, that for all practical purposes, it is quite sufficient to enable the operator to judge if he has obtained a satisfactory or unsatisfactory negative, and if the latter, of course giving him the power of doing it over again before he takes down his camera and quits the spot, which perhaps he may be unable again to visit. This is, in my humble opinion, an immense boon; and coupled with the small size and small amount of weight that the water bath causes, is a desideratum not obtainable by any other method that I have yet seen;—but then it would be useless for any other form of camera than Archer's,—it is part and parcel of the camera, and forms, with the plate-box, the most complete apparatus that has ever been invented, meeting as it does *every* requirement for the amateur or professional tourist. At home I never use any other camera, and for portraits I find it exceedingly convenient; the facility of being able to do any sized plate (of course within the limits of the dimensions of the camera), the absence of all chassis, and the inestimable advantage and convenience of not wanting tent or dark room for producing the picture fit (with the exception of drying it before the fire to varnish it) for the pressure-frame, an advantage that need not be dilated upon. I well remember astonishing a friend at Lynmouth, the day after I arrived there, in taking as good a negative as I ever did, (and which has since been engraved in his presence), in my Archer's camera, and whilst he was engaged in going to take his and developing it in his dark room somewhere in the village, I dried, varnished, and actually copied mine, showing him a good proof in hypo-sulphite on his return, bewailing his non-success.

One might certainly suppose, from my warm advocacy of the Archer camera, that I had some pecuniary interest in thus vaunting its praises, an accusation that anyone who knows me will readily refute. I have myself derived so many hours real gratification from the mode of manipulation which I adopt, and have so many hundred pleasing reminiscences of past days' labor to show, that I should be selfish indeed if I did not try to impart to my fellow-laborers in the vineyard, a means by which they may, if they choose, gather much of the finest fruit, and that too without all the terrible incumbrances that I often meet them laboring and toiling under. As to *describing* a camera like mine it is quite impossible, even with the aid of diagrams; it must be *seen*, and is then easily understood.

When out for a day's work I always take with me a small and ordinary binocular stereoscopic camera, with its tripod stand, and when I find the view I am taking (I mean my large one $8\frac{1}{2} \times 6\frac{1}{2}$) is one applicable for the stereoscope, I coat my stereo plate in my Archer's camera, excite it, place it in the stereo chassis inside my camera, and then, after exposing it in the stereo camera, return it to the large one, and develop and place it in the water bath, as before described; thus I *generally* obtain, with a quarter-of-an-hour's longer expenditure of time, one view $8\frac{1}{2} \times 6\frac{1}{2}$, and a double stereoscopic one of the same subject, with a facility and comfort which must be seen to be believed, and which, should I be enabled to pay you a visit next summer, shall be fully demonstrated to your satisfaction.

I was sorry to see this camera classed in your very useful Dictionary, amongst the amateur's *eccentricities*. "Let him laugh who wins," and he who bewails the ordinary discomforts of photography out-of-doors adopt it. It deserved a longer notice, and I can only attribute the imperfect account you have given of it from your not actually having seen one in use.

Apologising for this long story, which at last has found its end,

I am, Sir, truly yours,

J. W. G. Gutch.

Marine-terrace, Penzance, Cornwall.

P.S. I the other day, for the first time, produced a negative (of which I send you a copy) with that curious phenomenon, the *halo*, described in your Dictionary as surrounding the edges of dark objects in a photograph. The day was bright and favorable for photographic purposes, and the only unusual occurrence that I could remember was the *not* shutting the yellow window, so that the picture was taken with the camera lighted by the yellow rays; you will agree with me that the picture is a very pleasing one, with abundance of detail, and in consequence of the halo or artistic effect, not otherwise produceable. In the many thousand negatives I have taken, I have never had this occur before, and therefore wish you to make a note of it, as being an eccentricity occurring to an amateur using, according to your ideas, one of those *eccentric machines*—an Archer's camera.

THE PAPER NEGATIVE PROCESS.

To the Editor of Photographic Notes.

Dear Sir,—May I ask which of all the negative paper processes you consider to be the simplest? I want to take up one that requires least amount of manipulation and a minimum of apparatus, so as to render it efficient when on a tour, and staying, say at an inn, where one should have to work under many disadvantages. I have carefully read your Treatise on the Calotype process, also the different articles on the Calotype and Waxed-paper processes in your *Notes*. Of all these by far the simplest appears to be your process in No. 12. Has experience proved it good, or have you had any reason to modify it?

You do not say what time the papers will keep.

I have lately met with some discouragements in working wet collodion. All my chemicals were in good order, giving first-rate pictures when at Cambridge. I went on a tour, some 200 miles, and on arriving at my destination, I was unable to take a picture. I suspected the bath had got out of order with the shaking. You say in your Dictionary, that this will occasionally spoil a bath. At any rate my bath was so spoiled, that photographically speaking, my tour was a complete failure.

Will the paper process be more certain?

And can you suggest any remedy for annoyances of the above kind in future. I may tell you that my bath is kept in gutta-percha. Will that have an injurious effect?

D. Hornby.

Pembroke College, Cambridge.

—We believe there is no better process for taking negatives upon paper than that described in No. 12 of this Journal. The only improvement we can suggest is to substitute a little salt for some of the iodide of potassium,—say two grains of salt for two grains of iodide. The more the paper is washed after being excited the less sensitive it is, and the better it keeps; but the best plan is to excite the papers over night and develop them the next night, after taking the pictures. Some aceto-nitrate should be added to the gallic acid at the *beginning* of the development, otherwise the details in the shadows will not be developed, but on the contrary, the feeble impression produced by light will be obliterated. Use Hollingworth's thin paper, which is now manufactured for Mr. Cox, of Skinner-street, Snow-hill, London. It has a feebly acid reaction, and works very clean, giving great density. No other paper that we have tried is half so good. Use *pure* nitrate of silver for the nitrate bath; this point is very important. Give a long exposure, and always expose for the shadows, letting the lights take care of themselves.

If this process were tried more extensively, and operators would but use the right kind of paper, and *pure* nitrate of silver, and give a sufficiently long exposure, and not try the keeping qualities of the paper too much, it would soon become a favorite process, and we should hear less of the troubles of working wet collodion out-of-doors, and of travelling with a load of glass plates. For views 14 × 12 the process is admirable, and by working upon dry paper the photographer is better able to choose his subjects with care and judgment. The other day we were going to frame and hang some photographs, and out of a large selection of all kinds, and by a variety of processes, we fixed on prints from negatives by this paper process exclusively.

The difficulties with the nitrate bath, of which our correspondent complains, were no doubt owing to its having been made with a bad sample of nitrate of silver. [Ed. P. N.]

PRINTING UPON ALBUMENIZED PAPER.

To the Editor of Photographic Notes.

Sir,—Acting on your advice (p. 138, Vol. II, of the *Notes*) I have procured an "Argentometer," and find that my old sensitising solution contains 15-grains of nitrate of silver to the ounce.

I made a 50-grain solution for the purpose of comparing the results of immersion in strong and weak solutions. A sheet of Sandford's paper was divided, one half was placed on the weak, the other on the strong solution; both were floated for the same time; slips of both were placed on the same plate and equally exposed, and both were toned with the same bath. I can perceive no difference in the result.

A gentleman, in p. 258 of the Photographic Journal, Vol. IV., writes, (in reference to the weakness of the solutions which suffice to sensitize paper, as follows:—"It goes to prove that the "quantity of nitrate of silver usually prescribed is "unnecessary, as regards the effects produced on "themselves, provided the paper lies for a sufficient "time in the bath."

This gentleman has evidently not been a "Constant Reader" of your *Notes*.

Mellow, Nov. 16th, 1858. "N."

STEREOSCOPY.

To the Editor of Photographic Notes.

Dear Sir,—Will you give me your opinion which lens you consider best for stereoscopic pictures generally—the double one or the single?

I should like to be able to take groups and portraits, but I don't wish to sacrifice the views. I am afraid the portrait combination does not possess sufficient depth of focus for the latter.

Which camera do you recommend; one with two lenses, or Latimer Clarke's arrangement? The latter seems to me the most correct in principle, but instantaneous views are, with it, impossible.

Is the black tone one sees in paper portraits obtained from plain salted paper or from ammonia-nitrate?

From some cause which I cannot yet detect I have failed to develop a single negative with iron. They all look like miserable positives, and possessing no more density.

I possess a double quarter-plate lens by Chevalier, of Paris,—the focus, measured from the middle of the combination, is eleven inches. What sized plates for views would it cover? A plate 5 × 4 is covered quite sharp to the edges.

Worth, near Crawley, W. Spring.

—We think the best arrangement for taking stereoscopic pictures is a twin-lens stereoscopic camera, furnished with a pair of portrait combinations, having a stop between the lenses not exactly midway between them, but slightly nearer the back lens. Our reasons are as follow:—

1st, Stereoscopic pictures should always be taken simultaneously, because when an interval of time elapses between taking the first and second picture, figures move, or shadows change, or the lights vary. This can only be done by using a twin-lens camera, or a pair of cameras which can be opened and shut at the same instant. The latter would be found very troublesome, while the former is extremely simple, because both pictures are taken and developed upon the same plate.

2nd, When it is required to see things in the stereoscope exactly as we see them in natural vision, the stations should not exceed two-and-a-half inches apart, and the pictures should be properly mounted and viewed through whole lenses, the focal length of which is equivalent to that of the lenses with which the pictures are taken. The twin-lens camera is therefore suitable for taking stereoscopic pictures in which the natural appearance of things is truthfully rendered; and the parallelism of the axes of the lenses is strictly correct in principle because the pictures are always mounted upon a plane surface and not upon a cardboard bent in the middle. For the demonstratian of this statement see *Photographic Notes*, No. 30, or the article on the Stereoscope in our "Dictionary of Photography." On the other hand, when it is required for any special purpose to represent things in the stereoscope with greater relief than they appear to have in natural vision, the stations must be taken wider apart than the distance between the eyes, and then the twin-lens camera offers no advantage over Latimer Clarke's, but it labours under no disadvantage because it can be slid along a board screwed to the tripod stand, and the picture from the right station taken with the left lens, and *vice versa*, which saves the trouble of cutting and transferring the positive prints. The board should have a raised straight edge, against which the camera travels.

3rd, The twin-lens camera, furnished with portrait combinations, has this advantage, that it is suitable either for views or instantaneous pictures or portraits.' In portraiture, however, a little more relief is sometimes required than is obtained in this way. In views the distance between near and distant objects varies greatly, while in portraiture it varies but little, therefore the stations are in general taken about five inches apart; but natural truth is in this way sacrificed to effect, a practice which should not be encouraged.

4th, The stop should be placed a little nearer to the back lens in order to cure distortion. When the stop is placed nearest to the front lens the image of a straight line at the margin of the picture is curved *inwards* at its extremities; and when placed too near to the back lens it is curved *outwards* at its extremities. There is a point between the two extremes where the image remains perfectly straight, and that is the proper place for the diaphram. It must be found by trial. It lies nearly midway between the lenses but nearest to the back lens, because the focal length of this lens is shorter than that of the front lens. Distortion may be very nearly got rid of in the portrait combination when the stop is properly placed, but it cannot be got rid of in the common view-lens, and in that instrument it exists to a fearful degree.

Observe, however, that the portrait lens with a stop between the lenses is not suitable for taking ordinary views, for this reason, that the curvature of the image is so great that it does not satisfactorily cover a field of more than 20° even with a small diaphram. This is angle enough for stereoscopic pictures, but not enough for photographic views generally.

There is also this serious objection to using the portrait combination for views, viz., that it frequently gives a round spot of diffused light in the centre of the picture, whether the stop be placed in front of the front lens or between the lenses. This, however, may be prevented and the objection removed by pasting an annulus of blackened cardboard round the outer face of the front and back lenses at their circumference.

With respect to the development of negatives with iron, the process is quite satisfactory when the collodion is good and the nitrate bath in proper order; we have frequently taken dense and good negatives without adding any silver to the developer, and the half-tones are beautifully brought out in this way; but sometimes the nitrate bath gets incurably out of order for this process, at the same time that it works well with pyro-gallic acid. This difficulty is no doubt to be traced to the impurity of the nitrate of silver

The quarter-plate Chevalier would not cover a field more than five inches diameter.

[Ed. P. N.]

A CURIOUS RESULT IN DEVELOPING A POSITIVE

To the Editor of Photographic Notes.

Dear Sir,—As I was testing a sample of collodion a short time ago, I met with rather an unusual occurrence. I was trying a negative stereoscopic portrait, but found, on developing

with the usual pyro-gallic solution, that it was rather under-exposed. I thought I would try an experiment with it, so I washed it thoroughly, re-dipped in the bath, (rather hazardous to the bath, perhaps), and again poured on a proto-sulphate of iron developer, with acetic acid, but not nitric acid. Instantly a solid positive portrait flashed out, the blacks being as solid and dense as the whites and no transparency in any part. It was still undertimed so that the image was dark and sombre. I meant to have sent it to you, but in my absence it was thrown down and broken. I intended to have pursued the subject farther, but my time is so fully occupied that I have had no leisure. I supposed the dense black deposit in the shadows to be gallate of iron, resulting from a portion of the pyro-gallic left in the film. If any of your readers have the inclination and opportunity to try the experiment I should like to hear more of it. The bath was not injured at all.

F. Parsons.

50, Gallowtree Gate, Leicester.

A TRADE HINT.

To the Editor of Photographic Notes.

Dear Sir,—Allow me to draw the attention of the Trade to an article, the want of which has been long felt by Amateur photographers, and that is a cast glass bath, (inside measurement) 7½.-ins. high by 4¼.-ins. broad, half-inch wide, and not less than ⅜-in. thick, with a flange 1-in. deep around the top, which, together with the bath, would give a thickness of a ¼-in., and present a good surface for grinding and after-fitting. These proportions are not hastily but deliberately penned; 3½-ins. in width would suffice for stereo plates, but by giving 4¼-ins., ordinary plates, 5 × 4, &c., could be bathed in one and the same bath, thus avoiding the necessity of having two.

I am aware there are at present in the market glass baths for stereo plates about this size, but they are in many respects objectionable, having no flange, being *far too wide* for any but the most clumsy operator, requiring 18 or 20 ounces to fill them, besides being of an uneven thickness; although apparently stout, they are generally at the bottom not thicker than an ordinary glass vial. I saw in the window of Mr. Bolton, Chemist, Holborn, a glass *dish* (I suppose for toning stereo proofs), perfectly square, and of *even thickness throughout*, the bottom being perfectly flat, price 1s. 6d. This is the *kind of casting* I mean; it is a vast improvement on the old plan. Such a bath might be sold and yield a good profit at 3s. I believe that half the complaints of nitrate solutions arise from the horrid gutta-percha bath. Whatever they might have been, those *now* sold are very suspicious; but at the best gutta-percha is not equal to glass, which has the advantage of being cheap, clean, and chemical proof. Will Mr. Bolton supply this desideratum?

"Argentum Nitratum."

THE ALABASTRINE SOLUTION.

To the Editor of Photographic Notes.

Dear Sir,—Your issue of the 1st instant contains a letter from "John Horsley, F.C.S." notifying your readers of a fact, to photographers generally very well known: that the use of chloride of mercury for bleaching collodion pictures originated with the late lamented Mr. Scott Archer.

He then proceeds to offer another piece of information which, until he published it, was certainly unknown to any one but himself, namely, that "an article called Alabastrine Solution" was nothing but a solution of "mercurial chloride, about sixteen grains to the ounce, and a few drops of a solution of per-chloride of iron."

It might be sufficient for our own justification, as the sole agents for the Alabastrine Solution and Varnish, to state that this pretended analysis, if it refer to the Alabastrine Solution sold by us, and not to some imitation, is ridiculously wide of the mark. But we may add a word or two more on the remarkable logic of this gentleman.

The use of chloride of mercury, as a bleaching agent, we have said, is well known to photographers; but it is equally well known that it is almost impossible to submit a picture to its action without securing an unpleasant blue tone in the process of bleaching. The Alabastrine Solution is represented in our prospectus as effecting the *bleaching* without producing *blueness*, and not one word is said of its composition. If it effects this, even were it common salt and water, there could be no deception or breach of faith. Mr. Horsley says nothing at all of its action; but he says, "a more specious and deceptive prospectus I never read than this celebrated Alabastrine Solution," meaning, we presume then, the *prospectus* of the solution.

If the chemistry of this F.C.S. be as loose and careless as his logic and grammatical construction, it is not surprising that he should arrive at such erroneous results.

The "Alabastrine Solution" *does* contain chloride of mercury, in altogether different proportions to those stated, but it also contains *other* chemical agents, of which this gentleman has no idea whatever, the object of which is to correct the blue tone so objectionable in the bleached whites of the picture.

If photographers were able to obtain pictures by use of mercurial chloride, anything like equal in tone to those produced by the Alabastrine Solution, some specimens produced by which we forward, they will be wise to use it, but since the fact that they *do not* proves largely that they *cannot*, there is little doubt but all who have tried it will continue to use the Alabastrine Solution.

Nov. 22, 1858. Henry Squire & Co.

—The blueness produced by bleaching with bi-chloride of mercury is probably due to the formation of sub-chloride of silver, for there is no blueness about calomel. The alabastrine solution no doubt contains, in addition to corrosive sublimate, a solvent of chloride of silver. The specimens alluded to by Messrs. Squire have not yet been received. [Ed. P. N.]

W. N. Baxter, Northallerton. For printing magic lantern slides the dry collodion process may be employed; or if the negatives are not too dense they may be copied by means of a lens, and the

wet collodion process employed. The plan of putting a wet collodionized plate and the negative in contact has been lately recommended by a contemporary, but we very much doubt the policy of following that plan. When strips of cardboard are put between them the print is never sharp, even when a parabolic reflector is used. Dr. Hill Norris's dry plates may be put in contact with the negative, and an exposure of a second or two to diffused daylight is sufficient. The transparencies produced in this way make excellent magic lantern slides. If required to paint or retouch them, Canada balsam is the proper vehicle for the color.
[Ed. P. N.]

F. Grant, Edinburgh. A half-plate portrait combination does not work quite so quick as a quarter-plate combination, but it takes small pictures quite as sharp, and more free from distortion, and covers the field better to the edges.
[Ed. P. N.]

J. McGowan, Wigtown." The addition of chloride of sodium does not accelerate collodion. Put the diaphram *between* the lenses, and the corners of the picture will not be cut off. [Ed. P. N.]

"*Old Erin*" is thanked for his communication.
[Ed. P. N.]

"*Ignoramus.*" Either the collodion, or nitrate bath, or both, are in fault. With good collodion, and pure nitrate of silver, all will come right. But it is important also to clean the plates very carefully and thoroughly in the positive process.
[Ed. P. N.]

H. Haine's pictures of the Cave of Blarney are much admired. [Ed. P. N.]

"*R.*" The reply to *Y. Z.* in No. 62, was full of printer's blunders, and words misplaced. The proper reading is sufficiently obvious. [Ed. P. N.]

"*Amateur.*" We cannot insert your letter under an anonymous signature. [Ed P. N.]

An abstract of the proceedings of the French Photographic Society will appear in our next. Messrs. Davanne and Girard have completely adopted the theory of chloride printing given by us in No. 47.

☞ *The Communications of M. Voigtlander; Dr. Nash; Mr. Belfield Lefevre; and others, will receive attention in our next.*

Photographic Notes.

DECEMBER 15, 1858.

The present number concludes Vol. III. *The Index of Contents and Title page will be forwarded with the next number.*

There are among our readers many who only practise the Positive Collodion Process, but have become Subscribers to this Journal from the desire to be kept *au courant* with what is going on in other branches of Photography. It is a matter of regret that we cannot oftener supply this class of readers with useful practical suggestions relating to the process in which they are more particularly interested, since that process has been brought to a point beyond which it has seemed for some time difficult to advance. At length, however, we are enabled to call their attention to an improvement of considerable importance which has lately been made in taking Collodion Positives upon Glass. Everyone must have felt that the great defect of glass positives is the want of vigor in the whites of the picture, which are either of a dead leaden hue, or have a cold metallic effect. Now this great defect can be obviated by a simple process by means of which the leaden or metallic lights are converted into a dead white precipitate, having the appearance and beauty of marble or alabaster. This is effected by re-developing the finished picture with a solution sold by Messrs. Squire & Co., and called by them the "Alabastrine Solution." This solution has been advertised for some months, but we have not until lately had the opportunity of seeing any specimens obtained by it. A few days ago, however, Messrs. Squire sent us some specimens, which we have carefully examined, and of the beauty of which we cannot speak in too high terms. It is not too much to say of one of these specimens that it is, without exception, the most exquisite photograph we have seen. At the same time it must be admitted that a process which will occasionally yield a result of extraordinary beauty may, through imperfect knowledge of its peculiarities, break down in the majority of cases. Whether this be true or not of the Alabastrine Process we cannot say, but advise our readers by all means to give it a trial, for certainly if such results as we have seen can be obtained with uniformity and certainty the Alabastrine process is a great step in photography.

The composition of the Alabastrine Solution is a Trade secret, but if it is composed entirely of inorganic salts its analysis would not offer any great difficulties. Mr. Horsley, of Cheltenham, F.C.S., gave, in a letter which we published in No. 62, the results of an analysis which he had made of it, and from which he states it to be composed simply of bi-chloride of mercury, with a little chloride of iron. But in reply to that letter, we published in our last number one from Messrs. Squire, in which they state that Mr. Horsley has, in his analysis, omitted an important ingredient by means of which the blueness produced by bleaching with bi-chloride of mercury is entirely avoided; so we trust that Mr. Horsley will now be put upon his mettle, and try again. The blueness produced by bleaching argentine photographs with bi-chloride of mercury is probably due to sub-chloride of silver, in addition to the calomel which forms the dead whites of the picture, and if so, any solution which would destroy this blueness, must be a solvent of chloride of silver. Among those solvents there only occur to us at present the following, viz.: cyanide of potassium, alkaline hypo-sulphites, ammonia, iodide and bromide of potassium, and common salt. Cyanide of potassium could not be added to bi-chloride of mercury without decomposing it,—neither could an alkaline hypo-sulphite, —nor ammonia,—but bromide of potassium would not decompose it, and this might answer the purpose; or possibly a little salt and water, as Messrs. Squire suggest, may be the very thing added. At any rate the Alabastrine process is one which deserves the immediate attention of every professional photographic portraitist. Judging from a colored specimen we have seen, the dead white of an Alabastrine positive forms an excellent ground for dry colors; it is also so opaque to transmitted light as to be too dense for a negative to print from.

We insert at page 302, a communication from Mr. Belfield Lefevre, of Exeter, which we consider to be the most valuable contribution that has been made for some time to the Chemistry of Photography. It relates to the Theory of the Daguerreotype process. That process is so little practised now that the title of this paper may not perhaps recommend it to the notice it deserves, but it must be remembered that there are many strong analogies between all the processes in which iodine, bromine and silver occur, and that any investigation which throws light on the theory of one of them is likely to clear up some difficulties in the others. Take for instance any collodion negative of a view in which the

sky or some strongly lighted objects occur, and which has received sufficient exposure to bring out the details of dark objects in shadow, and examine such a negative by reflected light, it will be seen that the over-exposed lights have a *blue*, the properly exposed lights a *brown* tint. The same thing happens in the Daguerreotype; the over-exposed lights being *blue*. Or compare the solarized parts of a glass positive with those of a Daguerreotype, and the same blueness is in both cases perceived. This similarity in the effects due to over-exposure proves, we think, more than anything else, that a strong analogy exists between the action of light on the sensitive Daguerreotype plate, and the sensitive collodion film; so that if we can make out the theory of one process, we shall be very likely to gain valuable practical information with respect to the others.

In the Daguerreotype process the effect of bromine as an accelerator is very marked, while in the collodion processes difference of opinion exists as to the effects of bromine, and the general belief is that it is *not* an accelerator. Until very lately our experiments with bromides added to iodides in collodion led us to believe that for some reason or other the analogy between the Daguerreotype and collodion processes was imperfect as regards the effects of bromine; and altho' there was reason to suppose that such an analogy might exist, yet experiment seemed to settle the point the other way. Now, however, our opinions are changed, and a number of convincing experiments which we have recently made lead to the conclusion that bromine *has* the *same* accelerating influence in the collodion as in the Daguerreotype process; that is to say that collodion may, *under certain conditions*, be made six times as sensitive with a mixture of bromide and iodide, as with an iodide or bromide alone. These experiments we will now describe:

Take plain Alcoholic collodion, such as we have described in back numbers of the *Notes*, —also two solutions, one composed of alcohol S.G. ·825, containing 14 grains of iodide of potassium to the ounce, the other of alcohol S.G. 825, saturated with bromide of potassium. Then iodize some collodion with the iodizing solution by adding one part to three of plain collodion, and call this collodion I, because it contains iodide alone. Next, bromise the plain collodion by adding one part of the bromide solution to three of plain collodion, and call this collodion B, because it contains bromide alone. Lastly, make a mixture of equal parts of the iodizing and bromizing solutions, and bromo-iodize the collodion by adding one part of this mixture to three of plain collodion, and call this collodion M, because it contains the mixed iodide and bromide.

We have now three collodions ready for use. In order to compare them in the Positive process, make a nitrate bath of *pure* nitrate of silver, and acidify it with one minim to the ounce of *nitric* acid. Make the experiments with a twin-lens stereoscopic camera, furnished with single view-lenses, and a quarter-inch stop. (Mr. Thomas is quite right in saying that portrait-lenses are of no use for testing collodions). Coat one half of the plate with one collodion, the other half with another collodion, place it horizontally upon the dipper, immerse it in a large bath, and develop the pictures with the same ordinary developer for positives. Point the camera at a view out-of-doors, including high lights and strong shadows.

This being understood, first coat one half of the plate with collodion I, and the other with collodion B. I gives a creamy film; B a film which is exceedingly pale, in fact scarcely visible. Give a reasonably long exposure, say ten seconds, so as to bring out all the details fully. On developing, both pictures will come out together; there will not be much difference between them except in tone. Now compare collodion I with collodion M. The latter gives a very pale film, but not so pale as B. On giving the same exposure as in the first experiment the picture taken with M will be greatly over-exposed. Next reduce the exposure to two seconds, or less, and the picture taken with M will be correctly timed, and all the details in the shadows fully brought out, while that taken with I will only exhibit indications of the high lights.

From these experiments we learn that the analogy between the Daguerreotype and collodion processes holds good as regards the accelerating influence of bromine, *under certain conditions*, that is, as we shall see presently, when *organic matter is excluded from the nitrate bath and developer.*

Now, since we have found an exceedingly sensitive process, and the means of accelerating iodized collodion by the addition of a bromide, let us repeat the experiments with a nitrate bath acidified with *acetic* instead of *nitric* acid, and use a developer composed of proto-sulphate of iron and *acetic* acid; that is to say, let us introduce organic matter into the nitrate bath and developer, and note the results. The peculiar sensitiveness of collodion M now nearly disappears, and instead of being six times as sensitive as I, the ratio is only perhaps as five to four.

But to render the retarding effects of organic matter on bromized collodion still more evident make use of a *negative* nitrate bath containing acetate of silver; collodion I will then be found more sensitive than collodion M; and as for collodion B, it will be found more insensitive than either.

But to shew in the *most* striking manner the retarding effects of organic matter on bromized collodion, use the pyro-gallic developer, that is to say, attempt to take a *negative* with collodion M. All its good qualities vanish. While I gives a fine negative with a certain exposure, M requires perhaps double the exposure, and then gives a feeble worthless negative.

It appears then from these experiments, (which we have repeated so many times and under such varying circumstances as to leave no doubt of their accuracy), that the most sensitive photographic process at present known is that in which a collodion positive is obtained with a collodion containing a mixture of iodide and *bromide*, a bath acidified with *nitric* acid, and a developer containing proto-sulphate of iron acidified with *nitric* acid. It remains then to consider whether such a positive, consisting as it does of a thin metallic film, can be intensified into a negative.

The attempt to intensify a thin metallic film of this kind with a mixture of a developer and nitrate of silver altogether fails. The plan to which we must have recourse is the following:—After fixing and well washing the positive, pour over it a solution of bi-chloride of mercury. This will bleach the picture and convert the silver image into one composed of chloride of mercury, (calomel), chloride of silver, and perhaps a little black oxide of mercury. This image, when viewed by transmitted light, is more intense than before; but its intensity may be greatly increased by first washing it thoroughly, and then pouring over it a weak solution of sulphide of ammonium, which forms black sulphide of mercury.

With a portrait lens of 4-ins. or 5-ins. focus, a half-inch stop between the lenses, and the sensitive process which we have described, an instantaneous positive may be taken of objects out-of-doors tolerably well lighted, and the details of the shadows fully brought out. This positive may then be intensified into a negative by means of bi-chloride of mercury and sulphide of ammonium, judiciously applied; or it might be converted into an alabastrine photograph. It seems probable also that with an ordinary view lens and a half-inch stop, *large* pictures might be taken, sharp to the edges, of such strongly-lighted subjects as breaking waves, skies, &c.

If the experiments described in this article are as reliable and our conclusions as correct as we believe them to be, then this communication has considerable importance, and we advise our readers by all means to repeat the experiments described. It is a singular result that *nitric* acid should not be a retarding agent in the positive collodion process, when organic matter is excluded from the bath and developer. But chloride of silver darkens readily under nitric acid, and iodide of silver does not seem to be affected by the presence of nitric acid, so far as its property of receiving a latent image under the impact of light is concerned. Nevertheless nitric acid acts very differently in the Positive and Negative processes, for if we attempt to develop with pyro-gallic acid a negative which has been excited in a bath strongly acid with free nitric acid, not only is the negative thin and grey, but the details of the shadows are wanting; while if the very same plate is developed with the positive developer those details will be fully brought out. It appears therefore that nitric acid in the bath does not interfere with the production of a latent image, bnt simply with the action of an organic developer.

In trying the experiments described, the salts of potassium are recommended in preference to those of cadmium, for this reason, that the cadmium salts tend to gelatinize the collodion and impair its fluidity. In our opinion the cadmium salts ought never to be employed in the collodion process. Alcoholic collodion iodized with iodide of potassium preserves its color, sensitiveness, and good qualities for several months, and more than this cannot be said of collodion iodized with iodide of cadmium. In fact, the cadmium collodion, although it does not change its color and become *visibly* deteriorated, nevertheless undergoes *actual* deterioration and loss of sensitiveness by keeping. We believe the use of cadmium salts in collodion to be a mistake. The best keeping collodion is probably that which is made with *pure* methylic ether and alcohol, (the latter in great excess), reduced to the absolute state by distillation with caustic alkali. If perfectly pure and good methylated spirits could be obtained with certainty, the best collodion might be manufactured and sold with profit at 3d. per ounce. No collodion that we have used is so good as some we have lately made with pure absolute methylated spirits, and the potassium iodizer, and as soon as we can make sure of this result we shall offer photographers a first-rate Alcoholic Collodion at 3d. an ounce. This will perhaps tempt the paper-men to try the collodionized-paper process described in

our last number; and since we have now alluded to that process, we would observe that plain paper may be used instead of waxed-paper, if preferred, and the negative waxed afterwards.

The Journalist has occasionally the sad task of recording the death of one whose name and works are familiar to his readers. Within the last two months Mr. Fallon Horne, of London, and Mr. Ivan Szabo, of Edinburgh, have been taken from us. To these we have now to add the name of Robert Howlett. He died on the 2nd inst., aged 28, from an attack of typhus fever which followed a severe cold *caught by working in a new and damp operating room!*

Photography has its perils as well as its pleasures. One day we have to tell the story of a photographer who enters his laboratory with a lighted candle, a thing which he has foolishly done a hundred times before; he cracks a bottle of ether, and half-an-ounce, not more, is spilled upon the floor; presently the vapour reaches the light, and in two minutes the whole place is a raging furnace. But this photographer, after passing through an imminent danger from the explosion of a pound of gun cotton, escapes with his life; his career is not suddenly brought to a close through an act of thoughtlessness. But shortly after, another, and a far sadder story has to be told. In the prime of life, and vigor of health, a photographer returns from a holiday trip, during which he has tried a new lens, and with it obtained negatives such as he has never taken or seen before. Full of ardor and professional enthusiasm, he attends a Meeting of the Photographic Society, exhibits his results, and publishes a letter in the Society's Journal, that all may hear of the success of his experiment and profit by it. A few days after we hear from a mutual friend that this photographer has caught a severe cold through working in a new and damp operating room; then follows the sad tale of typhus fever; and before the Society of which he was a member can publish its next number, or hold its next meeting, a letter reaches us announcing his death! We conjure our readers to take warning from these events. Let them be more careful than ever how they meddle with ether and collodion by candle-light, but above all let them be careful of working in a damp room, or dabbling at this season in the wet. When the terrible penalty of an act of imprudence is exacted to the full, who is to blame but a man's own self?

In Robert Howlett we have lost a valued friend. In his profession he was an excellent manipulator, and a man of considerable taste, originality, and mechanical genius. We have seen a microscope, the lenses and brasswork of which he made with his own hands when a mere boy. To the Exhibitions of the Photographic Society he was a constant and a large contributor; he has executed many important commissions for the Queen and the Prince Consort; and published several very interesting letters in this Journal and that of the Photographic Society. He was the son of a clergyman in Norfolk. It is with deep regret that we record the premature death of this young and distinguished professional photographer.

An important new process, relating to the art of engraving has just been patented by M. Joubert, a French Engraver, who has for some years resided in this country. It consists in a method of hardening copper plates by means of a coating of steel, deposited by the electrotype process. A minute account of this process will be found in the Journal of the Society of Arts, for Nov. 24th. There is also a brief account of it in the Art Journal for this month, from which we make the following extract:—

"The hardening of the copper plate has long been in this country, as well as on the Continent, one of the philosopher's stones of the chemistry of Art, and the more earnestly has it been sought since the discovery of the method of dealing with steel, because a success in this direction must be a certain fortune to the discoverer; and if, as we hope, the surface of the plate, is so effectively enduring as to throw off thousands of well-conditioned prints this will be the fourth great Art-auxiliary which may be almost said to almost signalize the former half of the present century—we mean lithography, the hardening of the steel plate, photography, and, fourthly, this method of multiplying copper-plate engravings."

The above remarks show the importance of the discovery,—one which is likely to affect considerably the process of Photo-Glyphic engraving.

A third communication has been published, from M. Niepce de St. Victor to the French Academy of Sciences, relating to a supposed new action of light. Many of the experiments described have already appeared in the *Notes*, but others are new. We shall give a translation of the entire paper in our next number, and offer some comments upon it.

We have received from Mr. Gutch a copy of his Literary and Scientific Almanac for 1859. There is probably no work of the kind in existence which contains so much useful matter condensed into a small compass as this, and we advise our readers by all means to get it.

We would call particular attention to an important communication which we have

received from M. Voigtlander respecting the Orthoscopic lens, some comments upon which we shall offer in our next.

A new Photographic Society has just been established at Nottingham. We are glad to hear of this, for these Societies do a great deal of good, and deserve the hearty support of photographers.

Mr. Fox Talbot has kindly sent us a great number of his Photoglyphic engravings, some of which are by the process patented in 1852. On examining them very carefully, we are inclined to think the process one of great promise, and certainly an improvement on Photo-Galvanography. It would be hypercriticism perhaps to raise objection to the grain, which is scarcely perceptible in these prints; and then the sharply cut lines of the architecture and the gradation of shade in the distances, are very encouraging. The faults seem to be only such as improved manipulation may overcome.

Those who are trying uranium printing should use slack-sized paper, and add alcohol to the nitrate of silver developer. This gives greater intensity to the blacks.

The Council of the Photographic Society, at a recent Meeting, passed the following resolution :—

> "Complaints having been made that the papers communicated to the Society appear in other Journals before their publication in the Society's Journal, it is resolved that the Secretary be directed to request the proprietors to desist from any such publication."

This resolution is directed against the "Liverpool Photographic Journal" and the "Photographic News," not against the "Photographic Notes," because we have invariably abstained not only from anticipating the reports of the proceedings at the Society's meetings which appear in the Society's Journal, but also from copying any articles which have already appeared in that Journal. We have abstained from doing these things from motives of common honesty, and we decidedly think that in passing the above resolution the Council are in the right. No honest man would dream of disputing their argument. We take that for granted, and are not going, in what follows, to discuss the right and wrong of this matter, but simply to offer a few comments on an article by Mr. Crookes, relating to this subject, which appeared in No. 12 of the Photographic News, a Journal recently started and edited by him. In that article the writer attempts to defend the course in which he, as editor, has begun, and in which he says he intends to persevere in opposition to the resoluion of the Council; and also makes some curious revelations with respect to the Society's Journal, which people may believe or not as they choose. His argument is that the Photographic Society is a *public* body, and its meetings are *public* meetings, at which any reporter has a right to be present; and he informs us that his only object in publishing a report of the proceedings at those meetings is to serve the Society by giving to them increased publicity. "We may well ask," says he, "what interest can we be supposed to have in the publication of these reports beyond the desire to be of service to members of the Society"; and again, "our real motive is obvious to every impartial and honest man." Of course it is; —how could any honest man fail to perceive the true motive, considering that this gentleman was for about a year Secretary to the Society and no doubt still takes a lively interest in its welfare? It also appears from Mr. Crookes's revelations that the Journal of the Society, of which he was Editor for about a year, and which when he first became Editor was reported by him to be in a very flourishing condition, gradually dwindled down in its circulation (under his management) until, when he received his dismissal a short time since, it was brought to such a pass as to "depend for its continued existence on its being the chosen receptacle for all the desultory conversation indulged in by a few garrulous Members at their meetings"; while in another place he informs us that "not one in five who receive the Photographic Journal ever reads it." His own readers may either believe or disbelieve these statements; but to those who elect to believe them a clue will be afforded by which to account for the change which has recently been made in the Editorship of the Journal in question. The remainder of this gentleman's article is such a silly gasconade that the Council of the Photographic Society must now feel ashamed that the writer should ever have had the control of their own Journal.

The Photographic Society may not have done all the good that it might, could, and should have done; nevertheless, it has done much good, and will do more. A large part of its income is derived from the profits of the Journal; photographers will therefore no doubt generally condemn and oppose attempts to divert these profits into a private channel. The Council have perceived the ill effects of trusting incompetency, and now we are only expressing a general feeling in congratulating them on their present choice of Editor. No doubt they will treat the indecent attack of their late Secretary with

proper dignity, and should they at any time find it necessary to maintain their rights by an appeal to a legal tribunal, they may rely on receiving the support of every upright man to whom the circumstances of their complaint are explained.

The present number completes Vol. 3 of this Journal. Next year we hope to commence Vol. 4 on January 1st, and to continue the publication every fortnight as at present. No change will be made in the form or price of the Journal, nor is it likely that it will be enlarged. The present year has been tolerably prolific in improvements and discoveries in Photography, and we believe we have faithfully recorded every new thing of importance, and yet have had sufficient space, to spare. The fact is, the real improvements in Photography do not appear to afford material for more than twelve closely printed royal 8vo pages twice a month. Photographic Journals are multiplying fast, while the art does not appear to afford material for them all except by the wholesale copying of one from the other, the repetition *ad nauseam* of elementary matter, and accounts of trumpery modifications of known processes. This is becoming to the public quite a bore. Good original matter is what is wanted, not gossip, nor repetition. Nothing but study and experiment can supply this, and we do not believe the useful novelties in Photography to be so abundant but that a fortnightly Journal is adequate to report them. With these convictions honestly expressed, and the sincere desire on our part to render this Journal worthy the attention of our readers we shall enter on our FOURTH VOLUME, hoping for a continuation of the support which, with all its shortcomings, it has hitherto received.

Among the novelties which we can already promise for next year, is a new lens for which we are about to obtain a patent. It is a view lens, intended to include an unusually wide angular field, with equality of illumination, and *total* freedom from distortion. The principle of its construction will be fully explained in a treatise which we are now writing on "Photographic View-Lenses, their faults, and the remedy". We hope also to introduce a new and cheap collodion; and some novelties in apparatus.

And now, for the third time, we conclude our yearly volume of *Notes*, with sincere thanks to our readers and contributors for the support they have kindly given us, and with best wishes that all may enjoy a Merry Christmas, and a Happy New Year.

The general *résumé* of what has been done in photography in 1858, will appear in our next number.

Annual Subscribers will kindly remember that the term for which they subscribed expires with the present number, and we hope they will take the hint to renew their subscription promptly, that no delay may occur in forwarding the next number.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

WINTER SESSION, 1858.

The Members of the above Society held a Meeting at the Odd Fellows Hall, on Tuesday, November 30th, 1858.

The Vice-President, W. HOWELL, ESQ., in the Chair.

The minutes of the last Meeting having been passed, ISAAC SMITH, ESQ., was elected a Member of the Society.

Some Carbon prints from Mr. Pouncy, of Dorchester, were then exhibited. These prints were especially interesting, as illustrating some peculiarities of the process, more especially with reference to the kind of paper used. One print on albumenized paper having all the detail, but being singularly deficient in depth, while one on slack-sized paper rather thick, was deep in color, and the half-tones quite perfect. For landscapes, copies of engravings, and subjects of that class, the process leaves nothing to desire. The portraits were not quite so successful, but this may be owing to faulty negatives.

MR. OSBORN then read a paper on "Photographic Dodges." [This will appear in our next number.]

VOIGTLANDER VERSUS PETZVAL.

[*Communication from M. Voigtlander, to the Editor of Photographic Notes.*]

In my last letter, in answer to that of Professor Petzval, I promised to furnish such proofs as would put the matter regarding the new lens beyond any doubt, should Prof. Petzval continue to uphold his assertions concerning me. In consequence of his last letter, contained in No. 59 of the Birmingham Photographic Society's Journal, I find myself forced to appear once more before the public, though I am happy to say, for the *last* time, (as far as this question is concerned), for, what there remains to be settled between Prof. Petzval and me, beyond this letter, must be done by law—a tribunal where neither rank nor title are falling in the balance—where sarcastic wit will be found deficient to serve as a substitute for honest truth, but where simple facts are deciding the question. Had I been able to foresee how far Prof. Petzval would go in his personal attacks against me, I should not have

condescended taking any notice of them, but now I find myself much in the position of a man, who, having begun running down-hill for instance, finds himself involuntarily forced to continue his course. Certainly, if this controversy about the lens could have taken place in Vienna, where we are both well known, I should have strictly adhered to the question itself, without considering it worth my while to pay any attention to his personal remarks; but in England, where neither his private life nor his character are known—where his name is looked upon as sufficient authority for comments, somewhat in prejudice to me, the case stands differently. I therefore must be permitted to show Professor Petzval in his true colors, especially after his fresh attempts to impair my character in his last letter, in spite of my having desired him to come forward manfully and openly to say aught he has to complain of.

Opposed as I am, to an adversary who is fighting under the device of dissimulation, untruth and calumniation, all reserve and forbearance would be misplaced, though I am deeply regretting that this angry controversy has assumed so very personal a character. The fault, however, cannot be imputed to me, as I have become personal only in order to repulse the personal attacks of my opponent, and as *I have offered, as every body will remember, to decide the question in a more worthy manner, both to Prof. Petzval and to me;* therefore, if to be considered the aggressor in the literal sense of the word, in the true meaning of it, I can never be regarded as such.

Prof. Petzval, finding my letter remarkable in view of psychology, I may well apply the same remark to his, and perhaps with more justice, for he allows a curious and interesting insight into his character and principles when asking to what purpose all my assertions are made, having no interest for any-body, whilst these assertions have no other tendency than to repulse and disprove those little pleasant accusations of his, as: "my having misused his name,—my having practised deception upon the public by saying that such a lens was known to me,—my having spoken untruth," and so on. Can any honest man suppose me silently to submit to such accusations with perfect indifference to public opinion? Only a man like Prof. Petzval could suppose such a thing,—a man so little master of his own tongue, so deficient in manners and instincts of good society, to such a degree, as to use publicly expressions so very offensive to every decent ear as to have drawn repeatedly public reprimand and censure upon him. What shall we say of a man who pays no regard to himself and his own assertions? At first he stated that my memorial was rejected by the Academy as an absurdity, and this being disproved by me, he says: "It is not necessary that a learned corporation should have done it since common sense does it," which means, properly interpreted: *well, if my statement was false, never mind.* Is such proceeding honorable, or is it possible to discuss any point with a man who, in such a way, perverts and disowns his own words?

His endeavours to disarm my accusations of his having malignantly put the word "unsuccessful" instead of "not quite satisfactory," are past all belief. The former always means "without success," whilst the latter implies the contrary, at all events, "satisfactory to a certain degree." No sophistry whatever will give any other meaning to these words, and Prof. Petzval either considers his readers somewhat on a level with children or idiots, or we must piteously shrug our shoulders and consider him not in full possession of his mental powers, or influenced by a certain well-known propensity of his, which, to designate nearer, decency and esteem for the public, does not permit me.

In like manner he construes my words regarding his camera, which, certainly, after having seen the drawing of it, I do not consider any more as "ingenious" but on the contrary, as deficient in the highest degree, and not at all practical, and inconsistent with the first rules of mechanics. With regard to that camera, can any thing be more absurd than his coming to the conclusion that I could possibly not have known the lens, as I did not know the camera, which, according to his version, was indispensable. I have since made upwards of four hundred orthoscopic lenses; the most wonderful things have been done with them without that "indispensable" camera. Prof. Petzval's observations regarding "the common workman" furnish a further proof what an adept he is in the honorable art of malignantly perverting the meaning of words. When I made use of that expression it was in speaking of those persons who were calumniating me; therefore the expression was used in the sense these people would attach to it. I certainly find no dishonor in being a workman; I have been such from my childhood, and am now working all day and finishing every article that leaves my establishment, and am not afraid of dirtying my hands as Prof. Petzval is pleased to ruminate by his sarcastic remark about "kid-gloves." If Prof. Petzval does not consider me to be a good glass-grinder, he is, of course, quite welcome to any opinion he may form of me; yet I am astonished that, disposed as he is against me, he does not hesitate to attack in such a way a man whose works have been considered for more than twenty-three years, both by men of science and the public at large, as certainly not ranking amongst the last. I wonder he does not despise having recourse to "dodgery" only adopted by the most common trades-people to lower a competition, for by his commercial connexion with Mr. Dietzler he certainly has put himself on that level with me. It seems to have escaped the logical reasoning of the learned Professor, that he is giving himself, by this, a very unflattering testimonial; for how could he continue to remain in connexion with me for so long a time, when having never found me to be a good glass-grinder?

Prof. Petzval will oblige me by perusiug the Journal of the Photographic Society of Scotland, No. 68: he will find there the Report of the Committee appointed to examine both his lens and mine. One of the passages of that report runs as follows:

"Whether the Petzval or the Voigtlander lens is the best is a question the Committee have not been able to decide, as both are excellent." According to Prof. Petzval, that verdict decides the whole question between us, for he says: "The question at issue is, does he manufacture good lenses or bad ones? when good, they are valuable, even supposing he had fallen in with them but yesterday." I dare say that report may puzzle Prof. Petzval, for how is the stated excellency of my lenses to be explained, as I am not a good glass-grinder and as I have not had the assistance of his formulas, but have only been *forging* orthoscopic lenses? In what way have I been able to produce lenses equal to his? I must either have had other means, such as furnished by himself eighteen years ago, or the merits of his lens cannot be so very great, if an unskilful glass-grinder like me can produce as good ones: there seems to me to be no other alternative.

Prof. Petzval being so very fond of appealing to the common sense of his readers, in want of more convincing proofs of somewhat vague statements, I beg to ask him what does common sense say to his assertion, that I am not working according to his calculation, and that I am consequently misusing his name? There would be some sense in it, if only a short time ago I had used his name in my list of prices; but I have done so from the very moment I sold my first lens, after which I continued for some years in connexion with Prof. Petzval, and constructed my 2-ins. and 3-ins. lenses. Why did he not remonstrate at that time against my calling these lenses made according to his calculation? To do so now, *after the lapse of seventeen years*, is more than ridiculous. To show how common sense judges in that matter, I beg to state here some remarks of Mr. Horn, the Editor of the Photographic Journal, in Prague, who received a letter from Mr. Dietzler, written by Prof. Petzval (for I know his pen too well as to mistake it) containing his well-known statements, in language so inconsiderate, as to cause Mr. Horn, according to his own statement, to give only an extract of this letter in No. 5, vol. 10, of the above-mentioned Journal, and afterwards to comment in the following manner:

"Prof. Petzval, after having spoken himself, in his first pamphlet about dioptical researches, of his new lens, as made by Voigtlander and known by the name of the Voigtlander lens, comes now to state, in an indirect manner, that all the lenses made by Voigtlander during the last fourteen years are not to be considered as made according to his calculations; nevertheless the learned Professor has silently accepted, during the last seventeen years, all the tribute of the world, purporting that the Voigtlander lens was made according to his calculation." *How is this mystification of the whole photographic world to be understood?* Mr. Horn further says: "As Mr. Voigtlander publicly declares himself to be in possession of the formula and drawing of this lens, as received from Prof. Petzval since the last seventeen years, I, as well as every non-preoccupied person, must be astonished that Prof. Petzval *does not proceed against such audacity, the above statements being supposed not to be true*," to which I will add, particularly after his having obtained a patent, in spite of which I have openly sold my orthoscopic lenses in Austria and other countries.

Prof. Petzval is perfectly right in stating that as soon as the store of glass is exhausted, a new calculation of the curvatures must be made by means of the tabulas; he is likewise right in maintaining that I never received those tabulas from him, *but I never pretended to have received them;* but I have received the formulas for the first lenses, and, therefore, as long as I am working such glass, *perfectly identical* with the glass employed at first, and as long as I preserve, at the same time, *the primitive curvatures*, so long my lenses must be considered as *made according to the first calculation*. The great success of my lenses and the difficulty in getting crown-glass in sufficient quantity from the same source, soon caused me to apply to Mr. Bontemps, at Messrs. Chance, Brothers & Co., in Birmingham. The glass was analyzed, and Mr. Bontemps succeeded so well in making crown-glass of the same quality, that I could exchange a lens made of that glass for one made of the former crown-glass, even in an achromatic object-glass allowing a magnifying power of thirty times;—any photographer may convince himself of this by taking a very old lens of mine, and one of my last numbers of the same size, when he will find, by alternately exchanging the four glasses of these two lenses, that the effect of them is not at all impaired.

Whether, under these circumstances, my lenses are not to be called made according to the calculations of Prof. Petzval; of this I dare say every one will now be able to judge.

Prof. Petzval may raise another objection referring to his observations in one of his pamphlets, viz: that opticians have committed a mistake in thinking, that, by augmenting aperture and focus in the same proportion, they will be able to construct large lenses of the same perfection. I simply reply to that remark that he ought to have raised that objection, when, yet in connexion with him, I constructed my large lenses, and I must moreover deny, to a certain extent, Prof. Petzval's assertion being correct and refer to that end to his own description of the new lens deposited at the Patent Office at Vienna, in which he states that this lens may be made in any size, if only the proportions of the drawing are strictly observed, and his own 3-inch lens, for a proof of my refutation. That lens being twice as large as the first lens, being made 17 years later, and of quite different materials, every one should, therefore, consider that lens as being differently constructed with other curvatures: *that this is not the case*, I shall show when returning, in the sequel, to the same subject. Indeed, aperture, distances, and curvatures in this lens are, within a slight difference only in one of the latter, perfectly identical with those in my 3-ins. lens; a fact which shows what *prominent* and *indispensable part* these so often-mentioned tabulas have acted in the construction of this lens.

Prof. Petzval comes to the very logical conclusion that, as I confessed myself to be in no way connected with him now, I have spoken untruth in announcing my lenses to be made according to his calculation. I must leave it to clearer heads than mine to find out in what connexion the fact of our being separated now stands to all the facts before that time, and how the first can exclude the latter. His further statement about my having published, in Leipzig, a pamphlet, in which I confessed *never to have received from him any tabulas or formulas*, I must declare to be a direct *fiction* and *invention* of his, inasmuch as I *never published any paper* in Leipzic, only my circular about the orthoscopic lenses and my list of prices were inserted in a work on photography appearing there, but no allusion whatever was made in the first regarding his formulas or tabulas, not even his name was mentioned therein. It is certainly a difficult task to contend with a man, who, *repeatedly*, has taken refuge to direct *untruth*. Such an attempt may perhaps, be considered as foolish as—"fighting a windmill," or as vain as "carrying water into the tub of the Danaïds."

Considering all circumstances well, I cannot understand what objection Prof. Petzval can raise against my using his name in my list of prices. The case would stand differently, if he could prove that my position was no more the same, that I had lessened in my zeal to keep up my reputation. Against this, I think, the number of my lenses I am still selling at the original prices, will forcibly speak, whilst the following lines I received from Prof. Schrötter, Secretary of the same Academy, of which Prof. Petzval forms one of the members, will show that my position is not such as to throw any dishonour upon any one in connexion with me:

"Sir,—I beg to return to you, with many thanks, the four photographs you have been so kind as to

forward to the Academy; they have been inspected by all the Members present with great interest, and I cannot but congratulate you upon the progress manifested by these excellent photographs.

"Yours truly,

"To Mr. Voigtlander." "SCHRÖTTER."

I am inclined to believe that the virtuous wrath of the learned professor about that misuse of his name be less originating from an *excess of virtue*, but may rather be traced to a more *trivial* and *obvious* cause, viz.: finding my competition rather impeding the sale of his new lenses.

Prof. Petzval, in speaking of my want of gratitude towards him, calls himself the founder of my prosperity and position in life. The former I am willing to grant to a certain extent; the latter I must decidedly deny, as my position in the scientific world had been already founded before I had the honour of making Prof. Petzval's acquaintance. No. 576 of the Astronomical News of Mr. Schuhmacher, in Altona, contains a report of my telescopes which had been made in the year 1838, as I could easily prove by my correspondence with the illustrious Prof. Gauss of the year 1839; a correspondence which might show to the world, that, already at that time, I was not exactly the man, such as Prof. Petzval gives himself the trouble of representing me. It forms one of the features of Professor Petzval's tactics, never to speak out his opinion openly, but to content himself only to throw out such hints, by which my character appears impaired, leaving the unpleasant task to me in order to repulse these aggressions; to enter into such discussions as may bring down upon me the accusation of entering into particulars almost too private for publication. This consideration, however, cannot induce me to abstain from showing to the reader in what way and how far Prof. Petzval has to complain of any want of gratitude on my part, which he certainly wished to insinuate.

When Prof. Petzval gave me full permission to make the lens known, I immediately foresaw the immense success attendant upon it, and I therefore, hesitated to accept that permission forthwith, without stipulating any terms and requested him to propose any commercial arrangement. I had well done to state my proposition in as delicate terms as possible, for I was nearly shown the door, Prof. Petzval exclaiming almost in anger: "If you make "a fortune with that lens, you are welcome to it, "but how can you suppose *I, an imperial Professor*, "*would enter into any commercial arrangements?* I "am paid by government and my productions must "therefore be public property. To take a patent "(as I had likewise proposed) would be against *my* "*principles.*" I therefore accepted the lens and began manufacturing it in large numbers. Some months afterwards, the behaviour of Prof. Petzval towards me, became much changed: he threw out hints purporting his friends finding out one thing and another. After vain conjectures about the cause of this very strange conduct, a thought striking me, I enclosed £200 in a letter to Prof. Petzval in which I begged him to accept the enclosed amount not as an equivalent of the services he had rendered to me, but as a token of my gratitude, and that he would suffer me to renew, from time to time, and in a like manner, my acknowledgements of his services. The *success* of this experiment was a *perfect one.* I was again well received by him and all went on as smoothly as before, and we continued constructing all those various instruments, I have already been mentioning in my former letters. There is no harm in confessing, that, at the time I began to manufacture these lenses, my means were limited, my business rather small. Every man of business will understand, that, to enlarge the business all at once, to buy materials in large quantities, great outlays were unavoidable, while, at first, the returns were only slowly coming in. By these circumstances my means had been exhausted, (even those £200 above alluded to had been borrowed from a friend of mine) so that I was not for some time afterwards, in the position to offer to Prof. Petzval another material proof of my gratitude. Whether owing to his impatience or to some other cause, the fact was, that in the midst of all the work we did together, he became again so very strange in his behaviour towards me, that *I discontinued* my visits and I declare that it is *untrue* that *he has discarded me.* There is no blame whatever lying upon me concerning the rupture of our connection, and should we be put man to man, I have no doubt he would show the same want of *moral courage* and act the same part as he did, when, on a former occasion which I have already mentioned, he was obliged to *disown* those scandalous expressions he used regarding me.

Leaving my gratitude quite out of the question, every one must perceive that my own interest was calling forcibly on me to remain on friendly terms with him as long as possible, as by his productions a rich harvest seemed to be in store for me, but I preferred sacrificing my pecuniary interest to my honor as I could no longer put up with his strange conduct. Considering all the facts mentioned above, can it be regarded as my fault if Prof. Petzval has not shared my success to any extent he would have liked? *Could I do more than offering him to participate in it?*

As an instance of my honest intentions in my dealings with him, I will yet mention the fact, that I once offered him £5,000 (of course not to be paid down at once) for a microscope of his contrivance, on condition it possessed the qualities which he had been describing to me in very glowing colors; a microscope, which, may it be said *en passant*, has up to this moment never enlightened the world.

I do not hesitate to acknowledge, that I am greatly indebted to him; but should not some part of my success be due to my own exertions and to my energy? For how is it that all those opticians, with whom Prof. Petzval connected himself did not obtain the same success in spite of the mighty sound of Prof. Petzval's name?

To show in what light our respective merits, relatively to that lens, were regarded in Vienna, I may well state the words of an eminent man of science, upon meeting me in Paris and presenting me to another gentleman:—"Here is the man to "whom the world owes that lens, for, though "calculated by Prof. Petzval, we should never have "had it, without Mr. Voigtlander." There is indeed, much truth in that observation, when comparing what had been done during the comparatively short time of my connexion with Prof. Petzval, and all the time ensuing *nothing at all*, except the wonderful revival of an old lens.

After having shewn that it was Prof. Petzval who had deprived me of the means of proving my gratitude to him to a further extent, I will now elucidate the question from another side, remarkable in point of psychology; the man who first refused receiving any renumeration for the lens, accepts afterwards money for it, and in spite of this circumstance by which any *honorable man* would have felt himself *morally bound*, he hands the same lens over to a second and even a third party, and though finding it at first *inconsistent with his principles* to take a patent for the said lens, *adopts*, after a lapse

of seventeen years, that very same measure, not for a new lens, but for an old one, made seventeen years ago, and, instead of making use of his patent-right against the very man, who pretends having made that lens together with him a long time ago, he contents himself wilh *writing* long letters instead of *acting*. These are very curious incidents, showing, at all events, of how *pliable* a nature, the principles of the learned professor must be, and how *accommodating* to circumstances.

Squaring now our account, I cannot refrain from asking Prof. Petzval in what way he thinks to have come up to his promise and engaged word, which he gave respecting the following point:—

When the first pages of Prof. Petzval's pamphlet were printed and shewn to me by him, I found, to my astonishment, my name mentioned in no other way than as the manufacturer of the lens made according to his calculation. I could not help expressing my surprise at his not having stated how far I had partaken in the scientific part of the construction of the lens, and what assistance I had lent him. He appeared much moved by my observation, apologized for having perfectly overlooked that, and offered to make up for his forgetfulness in an appendix, he would write on purpose, the last pages of his pamphlet being yet under the press. I however did not accept his offer, as no doubt, he would have ample opportunity of making up for his present neglect in another work, but I have till now been looking forward in vain for the acquittal of his promise if else he does not consider his present mode of acting towards me as such. Whatever may have been his views regarding me, he ought not to have suffered himself to be influenced by them so far as to become *guilty of a breach of promise*; a man like him of such *immense* (?) merits might easily have spared a small portion of them, and, whilst doing justice to me and himself, would certainly not have been the loser by it. To the supposition of Prof. Petzval, that, perhaps I consider myself entitled to put his name on my list of prices on no other account than because others are doing so, I can only retort, that, to put *me* who have been connected with him for years, on a level with those who have never stood in any relation to him, surpasses, indeed, certain limits prescribed by *decency* and *honor*, and saves me the trouble of saying one word more about it. I shall certainly acquiesce in Prof. Petzval's desire to discontinue using his name in my list of prices, as our feelings are but coincident on that point, but I shall only do so after a certain time, to show that I am doing so, not because I consider him authorized to exact a thing in direct opposition to truth and facts, but because I please to do so.

Prof. Petzval's observation purporting that he should not like any body believing him to have found the association with me disagreeable, because he did not consider me to be sufficient a "gentleman" for him, is very ingenious and remarkable from a man, who, in the eyes of many a respectable person, has long since lost every claim and pretension to that title.

Prof. Petzval compares me to the bellows-treader, assigning to himself the part of the organist, in speaking of our respective merits concerning the lens. No doubt, my merits are *very* inferior to his, yet, I must say, that the metaphor would have come nearer to the mark, if he had compared me to the organ builder, inasmuch as, only by my supplying the first requisite elements, his calculation could be carried out.

What part Prof. Petzval is in the habit of assigning to the opticians with whom he enters into negociations, may be seen from the following statements:—Shortly after our separation, he connected himself with a philosophical instrument maker, but this connexion had no result and was soon broken up again. In the year 1844 he entered into relations with an optician of the name of Waibel, who, unsuspicious and not versed in these matters, was made to sign an agreement which left him entirely at the mercy of Prof. Petzval, who, not satisfied with Mr. Waibel having exhausted all his means, under the pretence of his not having come up to the terms of the contract, called upon him for the payment of a *fine of* £800 stipulated in the agreement for such an event. The case was brought for decision before an umpire, (fixed upon in the contract in case of disagreement) where Prof. Petzval's statement was proved to be *false* by one of *his own letters*, produced by Mr. Waibel, whereupon the latter was not only *released* from all his obligations to Prof. Petzval, but the contract itself was *annulled*.

Another incident may show in what way Prof. Petzval is "taxing" the public and what we have to think of his accusation that I am the inventor of the "chemical focus" and this pretension that all the lenses made according to his calculation were exempt of it. A five-inch lens, made by Mr. Dietzler, is offerred now to me at Vienna in exchange for and part of payment of one of my 5-in. lenses. I am informed that this lens was sold by Prof. Petzval at £25, (my price being £70), warranted to have no chemical focus, *by his word of honor and written promise in two letters of his*, whilst this lens has *a considerable chemical focus*, as I am informed. Should Prof. Petzval like to be served with a proof of this, as well as of all the particulars I have been mentioning, he is welcome to it every moment. After having given himself so much trouble to prove that all his lenses have no chemical focus, he speaks in his last pamphlet on his new lens as an object-glass for a telescope, page 15, of a method of achromatizing a lens, for the purpose of *avoiding as much as possible the separation of the two foci*, the optical and the chemical one. In the same pamphlet he mentions as something new that he examines all his photographic lenses by combining them with an eye-piece and by using them in the way like a telescope; whilst from the first moment I made the lenses, I tested them in this manner, which was seen and much approved of by Prof. Petzval. This method, therefore, appertains to me and not him, as I shall prove in the sequel. I do, however, not look upon this invention as a great achievement; on the contrary, only as upon one, as every optician could make by dozens; but I cannot find it honorable of Prof. Petzval to boast with the idea of another. Having, however, seen that Prof. Petzval does not hesitate to practice *plagiarism* by borrowing from men like Laplace and Euler their formulas, and by passing them off for his own, (as I shall shew in the sequel), I have perhaps, no right to complain if the learned professor descends to so humble a person as I am for a supply of his inventions. All these are facts which *I am prepared to prove* every moment and which show with what sort of a man we have to deal.

Having given, now, what I consider a very good likeness of Prof. Petzval as a man, in the general sense of the word, I shall also beg leave to analyse him as a man of science, less because he has challenged and authorised me by his attacks to do so; but more, because some persons may believe

that I ought to have spared a man who, surrounded by his friends, whose esteem he is enjoying, is to be considered as one of the pillars of science. In his first essay on dioptical researches, Prof. Petzval explains that all optical instruments must undergo a complete change in consequence of his new theory, and promises to publish from time to time, in proportion as the practical execution of these instruments should advance, the results of his researches. How has this promise been realized? After a silence of many years, at last, now and then, a report to the Imperial Academy in Vienna appeared, containing nothing at all of any scientific import, in fact, little more than general reflections and promises of "wonderful things" which were to come, perhaps in another ten years, at all events, offering no equivalent for a patience of fourteen or fifteen years; the whole put forth in a language little fit for a scientific corporation, but rather conveyed in expressions a tutor might use towards his pupils, while at other times, the somewhat excited imagination of the learned professor takes such a flight that common sense can hardly follow him. There are some blind followers who are encircling him like satellites, but the great number of men of science in Vienna and all Germany know perfectly well what they have to think of Prof. Petzval, and when speaking some time ago of his works, one of our first astronomers in Germany observed, that in all Prof. Petzval had hitherto published he found *nothing* remarkable but a *presumption* surpassing all limits of modesty, the inseparable companion of true merit.

We must indeed be astonished at Prof. Petzval's want of tact in causing a meeting of photographers in London to be enlightened by a lecture on his wonderful discoveries, and it was certainly common sense which induced one of the gentlemen present to call out: "What have we got to do with all this?"

Let Prof. Petzval produce a good instrument instead of sounding the trumpet in this way; and the learned professor may pardon me, if I find great analogy between his mode of proceeding and the custom of a party of rope-dancers who, mounted on horseback, sounding trumpets, and waving color, are passing thro' town, loudly proclaiming what wonderful feats they are going to perform the coming days.

As I should not like any body believing me to use against my adversary any such weapons which were not furnished to me by facts, and as it may at the same time, serve the readers as a key to the behaviour of Prof. Petzval against me, I beg leave to quote here a controversy between Prof. Spitzer, contained in the Austrian papers, viz., "The Press," No. 284, and "The Austrian Gazette," Nos. 473 and 558, to which I refer the reader for full particulars, which to reproduce here would lead too far; I shall therefore confine myself to quote some passages from Prof. Spetzer's reply to Prof. Petzval's critical memoirs on a mathematical work of the former, contained in the "Zeitschrift füt Mathematick and Physiek," edited by Professor Schloemitch and Dr. Witzschel, 3rd year, Vol IV.

"I am giving up at once all hopes and every intention of convincing thereby Prof. Petzval; for how can I hope (even if I were disposed) to accomplish a proof to convince Prof. Petzval, as it is impossible to me to urge him to the acknowledgement of the fact that a method which has been published more than *three quarters of a century ago*, and which may be found printed almost with the *same letters* and *symbols* in the memoirs of the French Academy of the year 1782, page 47, belongs to Laplace and not to him; for upon my attempt of doing so, he says: Nevertheless I call this method my own, as at least for the time being, it has not yet been proved to belong to another man, as Laplace for instance."

. . . .

"Prof. Petzval thinks that this remains to be proved, at least for the present; well then, let him consult the memoirs of the French Academy of the year 1782, and he will find there, page 47, the same method with the same letters and symbols, not only applied to differential equations in general but in particular to the differential equations, which he solves miraculously enough, and as if it were by some *funny chance* after Laplace's method and notations."

. . . .

"As Prof. Petzval has read my work from beginning to end, he must, of course, have seen the last page of it; but then, it appears to me incomprehensible how he can repeat such *untruths* so many times."

. . . .

"I will, in order not to tire the reader, conclude by saying that I do not hesitate to submit my productions to the opinion of mathematicians, for which I am always thankful even in case it should be unfavorable but just; however against a critique, *untrue* and *calumniating*, where faults are imputed to me which I never committed, and where my discoveries are taken from me and assigned to others, *I must raise a solemn protest.*"

To this I will add that Prof. Spetzer's memorial was accepted by the Academy, in spite of Prof. Petzval's proposal to reject it, he having been appointed to report to the Academy about that work, and in one of the meetings of the Academy, Prof. Petzval, after having been hammering away upon Prof. Spitzer without mercy for more than an hour, during which time the assembly amused themselves by looking at photographs without listening to him, worked himself at last into such an excitement, as to throw the glove to Prof. von Ettingshausen and to all those who dared to be of Prof. Spitzer's opinion. Should some persons observe, that all this has little to do with the question at issue, I beg to rejoin, that I am only writing for those persons, who take sufficient interest in this affair, and though I allow these allegations to be only of secondary importance in my controversy with Prof. Petzval, yet, as I have once entered upon this certainly unpleasant task to depict a man like Prof. Petzval, I must carry it through, and the above-mentioned facts will, no doubt, come to the point, as they show that a man, who must suffer himself to be *accused publicly* by another man of science of having spoken *untruth* and of having *calumniated* him, may feel still less scruple to act in a like manner towards me, whom he perhaps considers to hold an inferior station in life.

I shall, however, proceed now to the question itself by proving not only that: 1st, in contradiction to the assertion of Prof. Petzval, a lens for taking landscapes was really made by me 18 years ago according to his calculation, but likewise by shewing, 2nd, this lens to be the same as the lens in question in our controversy.

Prof. von Ettingshausen, after his return from Paris in 1840, where he had been in direct intercourse with Daguerre himself, was considered, at that time, as the representative of this new art in Vienna, and, anxious to bring it to the highest

degree of perfection, he desired Prof. Petzval to investigate why the lenses used by Daguerre had a stop, and whether he could not contrive better lenses. Prof. Petzval entered into the question, and the result of his investigation was a lens for landscapes and another for portraits; in fact, a compound lens consisting of three achromatic lenses constructed exactly in the way of his present lens; only the two systems were mounted separately instead of being united in one body.

It will be seen from this statement that the very desire of Prof. van Ettinghausen to get a better lens for landscapes, occasioned the existence of a lens for landscapes even before one for portraits was desired.

I have already hinted as my intention that the case between Prof. Petzval and me must be brought besore a forum, where I shall not fail to call upon Prof. von Ettingshausen to certify, upon his oath, all my statements, and I have good reason to believe that this gentleman will remember all the particulars concerning this subject. I am also happy to say that I am able to furnish by the subjoined letter from Mr. Martin, custos of the imperial polytechnic library in Vienna, the most *decisive* and *convincing proof* of all my assertions.

"Vienna, Oct. 18, 1858.

"Dear Sir,—You desire from me some information on three points relating to the time when we were in scientific connexion with one another.

"Soon after Daguerre's invention, I tested the efficiency of the first apparatuses, made by you according to Prof. Petzval's calculation. One of these apparatuses, a double achromatic lens, intended for taking likenesses, shewed already upon the first trials the inconvenience, that when the focus was adjusted upon the eyes of the person, whose likeness was to be taken, that the ear-flaps appeared sharply marked, whereas the eyes appeared delineated with less precision. At first this phenomenon was attributed to a wrong position of the ground-glass relatively to the Daguerrean plate; but afterwards, upon closer examination, the same inconvenience was likewise met with in other apparatuses, *and it was scientifically proved to be owing to the difference in the foci of the optical and chemical rays of light.*

"The second point relates to the method of testing your lenses, and I recollect that, *from the first moment, you used to combine them with an eye-piece, and test them in the way an object-glass for a telescope is tried.*

"The third point concerns the testing of a combination of lenses, *calculated by Prof. Petzval for the purpose of taking landscapes*, which I undertook *nearly at the same time.*

"This combination of lenses was to produce a plane image and a large range, and the image was to fill up the whole surface of a normal Daguerrian plate. The aperture of this combination was about 1¼-in., and the focal distance 10-ins. or thereabout. The image obtained by this combination was very precise indeed, but affected by two inconveniencies: 1st,—there was not scope enough when setting to the point on the ground-glass to adjust the difference in precision between the fore and back-ground, and the slightest change in the relative position of the ground-glass and the plate occasioned unprecise images. 2nd,—The images of the objects to be represented (houses) were too small in comparison to the image. In the image of a large place, a great part of the surface of the plate was taken up by the ground and the sky, whilst the buildings, occupied, proportionally, but a small streak of it. In consequence of these inconveniences, and, perhaps, also from other reasons, *this combination of lenses was, at that time, laid aside, and has been, for aught I know, no more used till now.*

"This is the averment of the three points, which you solicit from me, and which I think I have no right to withhold from you. As you intimated that, perhaps, certain circumstances may induce you to summon me as a witness in a legal way, I preferred summing up, in a concise manner and by writing, what is still alive in my recollection and whatever I am able to answer for. As to the shape of the lenses, their curvatures and the arrangement of the whole combination, I don't know at all any thing positive.

"It appears to follow from your request, that you intend implicating me, with regard to my statements, into your controversy with Prof. Petzval. I confess candidly that every public proceeding against the said Prof., whom I esteem on account of his scientific productions, would be the more disagreeable to me as I am convinced, that, if Prof. Petzval's declarations should not be in perfect unison with mine, this may be ascribed to the pardonable circumstance *that Prof. Petzval may have forgotten the facts mentioned in my letter*, in consequence of the multiplicity of analogous pursuits in which he has been engaged during the long interval of eighteen years, or thereabout, between the present and that time.

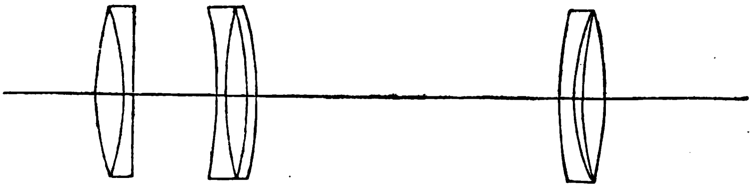
"Yours truly,

"Martin."

"To Mr. Voigtlander."

I cannot but find it very honorable on the part of Mr. Martin, that he tries to find out an excuse for Prof. Petzval, with whom he stands somewhat in private intercourse, but I am sorry to say that I do not consider it possible Prof. Petzval should have forgotton such important facts, especially after my having recalled all the particulars to his mind.

It will be found that the letter of Mr. Martin confirms my statements about three different points: 1st,—*The existence of the chemical focus in the very first lens for portraits*; 2nd,—*my having tested the lenses from the first moment, in the way Prof. Petzval describes as his own and new method*; 3rd—*my having made a lens for landscapes at the same time when making another for portraits.* It will be found afterwards that the description of the lens by Mr. Martin coincides exactly with the lens stated in the document of Prof. Petzval; that the lens was not found quite satisfactory was only owing, as I stated already, to the circumstance that *no stops* were used; let the new lens, as presented now, be used without them, and the same inconvenience regarding objects in different distances will be encountered. I have now to prove, that this lens is no other than the so called new lens of Prof. Petzval, although at all events in consequence of the most *positive statements of Mr. Martin, Prof. Petzval must be found guilty of having shamefully spoken untruth in denying my having worked according to his calculations, any other lens than the one for taking portraits. The following is a legalized copy and translation of a drawing and description of two systems of lenses with their curvatures, handed over to me by Prof. Petzval, eighteen years ago.* A similar legalized document I have placed into the hands of my agents in London, Messrs. George Knight & Co., for the inspection of every one, to whom I have likewise forwarded the Journal containing the controversy between Prof. Spitzer and Prof. Petzval.



First double lens, consisting of a double-convex lens of crown glass, and a double-concave lens of flint glass

$r_1 = 36{,}4''' = 3''\ 0{,}4'''$ $r_2 = -28{,}5''' = -2''\ 4{,}5''' = r_3$ $r_4 = 300'''\ 25''$

$r_1 = 3{,}00''$ $r_2 = -\ 2{,}37$ $r_4 = 25''$

The dispersing lens of compensation consisting of a double-concave lens of crown glass and a convexo-concave lens of flint glass.

$r_1 = -86{,}4''' = -7''\ 2{,}4'''$ $r_2 = 50{,}8''' = 4''\ 2{,}8'''$ $r_3 = -126{,}3''' = -10''\ 6{,}3'''$ $r_4 = -3{,}69''' = -3''\ 0{,}9'$

$r_1 = -7.11''$ $r_2 = 4.32''$ $r_3 = -9.03''$ $r_4 = -3.11''$

The converging lens of compensation consisting of a convexo-concave lens of flint glass, and a double-convex lens of crown-glass.

$r_1 = 72{,}1''' = 6''\ 0{,}1'''$ $r_2 = 25{,}3''' = 2''\ 1{,}3''$ $r_3 = 31{,}3''' = 2''\ 7{,}3''$ $r_4 = -102{,}8''' = -8''\ 6{,}8''$

WE Certify this to be a copy of a drawing and a literal translation of a German document, presented to us by M. Voigtlander.

DR. AUG. ELHDE, ***Prof. of Mathematics and Natural Philosophy, at the Collegium Carolinum.***

DR. HERMAN SCHEFFLER.

These Signatures verified,

Brunswick, Nov. 12, 1858.

WILLIAM HUCH, ***Public Notary.***

It will be observed that, with regard to the first lens, the numbers marked by pencil are but a reduction in inches and decimal parts of an inch of the numbers noted in the first columns, which are expressed in twelfth parts of inches, with regard to the second lens, the two columns of numbers do not coincide, but each of them are denoting different curvatures, of which I shall speak in the sequel.

By multiplying all dimensions and curvatures as given in that document by 2, we get three lenses of 3-ins. aperture, forming two systems of lenses with the following curvatures :—

FIRST LENS.

$r_1 = 6''$ $r_2 = r_3 = -4{\cdot}74''$ $r_4 = 50''$

SECOND LENS.

$r_1 = -14{\cdot}22''$ $r_2 = 8{\cdot}64''$ $r_3 = -18''06$ $r_4 = -17{\cdot}133''$

THIRD LENS.

$r_1 = 12{\cdot}166''$ $r_2 = 4{\cdot}216''$ $r_3 = 5{\cdot}216$ $r_4 = -17{\cdot}133''$

The 3-ins. lens of Prof. Petzval, as presented by him to the public, is constructed in the same way and consists of the same two systems of lenses, perfectly identical in principle with those in the above document and only with some insignificant differences in some of the curvatures. Taking at first only the first and second lenses into consideration, as forming the combination for landscapes, whilst the first and third lenses form a combination for portraits, of which I shall speak afterwards, I beg to state that I have verified this new lens of Prof. Petzval and found the aperture of the second lens only two-thirds of that of the first, whilst in the drawing they are equal. The curvatures are as follows :

$r_1 = -14{\cdot}445''$ $r_2 = 8{\cdot}5''$ $r_3 = -21''$ $r_4 = -6{\cdot}143''$

In comparing these curvatures with those above, we find the following differences :—

$\Delta r_1 = 0{\cdot}225''$ $\Delta r_2 = 0{\cdot}14''$ $\Delta r_3 = 294''$ $\Delta r_4 = 0{\cdot}077''$

Δr denoting the difference.

With regard to the aperture of the two lenses, I cannot allow this to have any influence upon the principle or nature of the lenses, and it can be of no importance at all, because Prof. Petzval himself, by applying a number of stops to the second lens, alters that aperture each time he changes the stop ; therefore the aperture of the second lens is variable, whilst that of the first lens is constant. The same thing it is with those little differences in the curvatures, for it is obvious, that, if such differences could gain for the lens the name of a new lens, each time other materials were used, different curvatures according to the tabulas must be obtained, and therefore, as many so called new lenses might be presented to the public as different materials were employed, whilst all these lenses ought to be regarded as of the same principle and resulting from the same theory. Every optician knows that even in an object glass, which demands a great deal more care, there are some curvatures which are very delicate, whilst others are not so. He knows that the inner curvatures, having more influence upon the spherical aberration, must strictly be worked according to the dimensions furnished by the calculation, whilst with regard to the exterior curvatures, which are bearing more upon the chromatical aberration, a certain scope is allowed to him, variations in the exterior curvatures being, even to a certain extent, founded upon theory, as the achromatism of a lens can never be obtained perfectly, there always remaining a secondary spectrum. The calculator is therefore at liberty to consider exactly such colours as will suit his purpose, and according to his choice, he will get,

with the same materials and upon the same theory, some of the curvatures different, whilst others will remain the same.

I further beg to insert here the description of the new lens by Prof. Petzval, deposited at the Patent Office in Vienna.

The new lens consists of two achromatic lenses of which the first as well as the second one are again compounds of two parts, viz. :—a lens of crown glass and another of flint glass. The lens of crown glass of the first compound is a double-convex one, the less convex side being turned outside, whilst the more convex side fits exactly in the inner part of a lens of flint glass, both being cemented, this lens of flint glass is double-concave, the second curvature being very little concave, so that the compound is very nearly plano-convex, but in fact being considerably convex towards the outside, with a slightly concave part inside. The exact form is seen by means of the drawing.

"The second achromatic compound, consisting of a lens of crown glass and another of flint glass with an aperture somewhat smaller than that of the first lens, is placed from this first lens at a distance varying from one-twelfth to one-sixteenth of the focal length of this first lens, according to the purpose the lens is to serve for. The lens of crown glass is double-concave, the most concave curvature being turned towards the interior of the apparatus, the second lens of flint glass is a meniscus, turning the convex part towards the interior of the camera, in the position and dimension seen in the drawing.

"The dimensions of the lens are forming no prominent part of the invention, as they may be executed on any dimensions provided the similarity be already observed, and as they will all give most perfect pictures if executed in such a way.

"Joseph Petzval, Professor."

In this description there is no question about apertures and curvatures, only the principle is mentioned. This being the same in both the lenses, allowed by Prof. Petzval himself, therefore, according to his own declaration, his lens cannot be called for. To show what little influence those little differences can have upon the practical effect of the lenses, I beg leave to adduce here a curious incident. Upon finishing and testing a certain number of my 2-ins. Orthoscopic lenses, I found that two of these lenses gave, in the usual position of the ground glass, no picture at all, but that the picture was a pretty good one at a considerably greater focal distance. I examined thereupon the different curvatures of the lenses, fancying that some mistake had been committed in the working of the lenses, and upon finding all the curvatures correct, I ascertained the weight of the lenses and discovered that the meniscus lens, instead of being made of flint glass, was made of crown glass. If such a difference could have no great influence upon the nature of the picture, what can then those differences in the curvatures signify? indeed, the second lens is a very insensitive one in comparison to the first lens; for if in this first lens, for instance, the flint glass lens was exchanged for another, also of flint glass, but of different density, the effect is entirely lost, and the whole picture is found covered with colors. I have forwarded one of these meniscuses, made of crown glass instead of flint glass, to Messrs. George Knight & Co., and every photographer will oblige me by making the trial himself. That any little differences in the curvatures have no influence upon the quality of the lens, may be seen from the report of the Committee in Scotland, who pronounced my lenses to be of the same excellency as those of Prof. Petzval; yet my lenses are not worked according to the curvatures stated in the document of Prof. Petzval, neither are they like the curvatures of the new lens made by Mr. Dietzler, of course, all this regard to the second lens, the first one being in every case the same. The curvatures of my second lens are as follows :—

$r_1 = -15''$ $r_2 = 8{\cdot}5''$ $r_3 = -22''$ $r_4 = -6''$

There are no considerable differences in the curvatures; still Prof. Petzval pretends in his last letter, that I have copied his lens so well as to leave a difference of 3 inches between two of the curvatures, which clearly shows that Prof. Petzval is writing about things without having given himself, previously, the trouble of *ascertaining the facts.* My being able to ascertain in the curvature of a lens to some thousandth of an inch, will prove whether I am obliged to have recourse to so clumsy a method as Prof Petzval supposes me to have employed in copying his lens, should the formulas, received from him, not have saved me that trouble.

Having shown that, in spite of those differences of the curvatures as really existed in both the lenses, the one, now presented as new, cannot be considered as such. A most extraordinary discovery I only made a few days ago will prove the perfect identity of both the lenses. Prof. Petzval having entrusted to me the numbers marked by pencil as those according to which the curvatures were to be done, I had of course no occasion whatever to ascertain whether these numbers were coinciding with those of the first columns, particularly after knowing that to be the case regarding the first lens; what was then my surprise at finding, *now*, that the two columns of numbers denoted *different curvatures.* Reducing the first column into inches and decimal parts of an inch and mutiplying the numbers we get by two, we obtain the following curvatures :—

$r_1 = -14{\cdot}4''$ $r_2 = 8{\cdot}466''$ $r_3 = -21{\cdot}049''$ $4_4 = -6{\cdot}15''$

the curvatures of the new lens being, as we have seen:

$r_1 = -14{\cdot}445$ $r_2 = 8{\cdot}5$ $r_3 = -21$ $r_4 = -6{\cdot}143$

we get therefore:

$Dr_1 = 0{\cdot}048''$ $Dr_2 = 0{\cdot}034''$ $Dr_3 = 0{\cdot}049$ $Dr_4 = 0{\cdot}07$

which proves these two lenses to be perfectly identical for I should think the most scrupulous person must allow those differences only arising from the execution of the lenses, *and the proof is thereby established that Prof. Petzval, in spite of his having caused me to execute the lens with different curvatures, has already, at that time, communicated to me the very same curvature according to which his present lens is worked; it is proved that he has spoken untruth and practised deception upon the public when presenting his lens as the result of a new calculation.* I am quite at a loss to guess what may have induced Prof. Petzval to practice such mysticism upon himself, me, and all those persons in expectation of the new lens for landscapes, when already at that time he was in possession of it, in spite of which he suffered the world to feel the want of it for seventeen years,

The identity of the two lenses throws another very singular light upon him. Having heard Prof. Petzval repeatedly deny my working according to his calculotions on account of the want of those indispensable tabulas, we meet here with two lenses

of his, one made *seventeen years later* than the other, by *two different opticians* and, of course, of quite *different materials, but both with exactly the same curvatures*, which proves to evidence, for a second time, that Prof. Petzval *has not made use himself of his own tabulas*, in spite of their often mentioned necessity.

What must we think of Prof. Petzval when comparing that fact with the following passage in one of his letters: "Perhaps in a whole century optical glass is not produced twice of the same identity. Therefore the calculator is obliged to extend his calculations over all descriptions of crown and flint glass," &c., &c.

There is in the English language, such a word as *humbug*. It is certainly not a very polite one, yet there are occasions where it may appear well applied, and could not easily be replaced by another expression.

I shall now pass on to Prof. Petzval's lens for portraits.

We have seen that the first lens of the combination for landscapes as well as portraits of Prof. Petzval is the same as that stated in the document.

I shall now examine his third lens, forming the second lens of the combination for portraits of which the curvatures are found as follows:—

$$r_1 = 12{\cdot}166'' \quad r_2 = 4{\cdot}216'' \quad r_3 = 8{\cdot}216'' \quad r_4 = -17{\cdot}662''$$

Comparing these curvatures with those resulting from the document and stated previously, it will be seen, that *also this lens is exactly the same as the corresponding one in the document*, with only this difference in one of the curvatures,

$$\Delta r_4 = 0{\cdot}589''$$

which shows that also the portrait combination of Prof. Petzval is no new one, but exactly like mine. Be it observed that in the drawing the second pair of lenses are in direct contact, while all my lenses had, from the first moment, been separated by a ring. Prof. Petzval and I finding that, by this ring, we could compensate some errors, which must have taken place in the calculation. As theory did not demand such a separation, as we see from the drawing, and, as the second pair of lenses in the new portrait-lens of Prof. Petzval are separated in a like manner, I consider myself fully authorized to say that this lens cannot be the result of a new calculation. Indeed, it would be a very strange coincidence of circumstances, if two lenses, made according to two different theories, within 17 years, of quite different materials, should have the same curvatures with the sole exception of a difference in one of them, and that in *both lenses the same means to compensate an error* should have been adopted. I can perfectly well account for the circumstance of one of the curvatures differing. This lens has been made of crown glass of a *greenish color* and of *different density*. To correct that difference, one of the curvatures was changed a little, and, for the same purpose, the lenses were also a little more separated than mine are. I invite every photographer in possession of this new lens made by Mr. Dietzler, to exchange this second pair of lenses for the second pair of one of my 3-ins. lenses, and he will improve the lens somewhat, for he will get more light and rather more flatness of field.

If I am well informed, Prof. Petzval has proved to the Academy at Vienna, in consequence of my memorial, that his new lens is the result of a new combination. We have seen how far this can have been the case; but even allowing it to be a fact, he cannot make me change my view on this subject. Prof. Petzval has not presented to the Academy his calculations, but only the lens, as the result of it; therefore this lens, being neither new in principle nor in construction cannot be called new.

The way by which Prof. Petzval had arrived at the same former result may be new, but this cannot vindicate for him the right to transfer that name to the object itself, as we may arrive at the same end by a multitude of different ways, and as we have not to do with *mechanical speculations*, however new and interesting they may be, but with a *practical object*. If Prof. Petzval had presented his new lens as an improvement or as a revival of his former calculation, and, if he had mentioned, at the same time, as he was in truth and honor bound to do, that a lens had formerly been made on the same principle by me according to his calculations, no protest nor controversy would have been possible on my part, and the merits of Prof. Petzval, as to that new lens, would have remained the same. So far the question whether the lens may be regarded as new or not, seems to be decided, but this question has still another side more important to me. Prof. Petzval has denied my even knowing the new lens; he has accused me of saying untruths, and of deceiving the public by pretending to have made such a lens according to his calculation at the time already mentioned, all with the malignant purpose of impairing my character. The proofs I have given for all I have stated would, indeed, save me the trouble of any further comments, the facts speaking sufficiently for themselves, and I fear that by my long discussion, I have already bestowed upon Prof. Petzval and his conduct more importance than he really deserves; however, it is my earnest desire to bring, by all means, this angry controversy to a close, the more so, as I feel neither the desire nor the inclination to ward off those new attacks, with which my adversary may assail me from his inexhaustible store of malice, calumniation and sophistry, in spite of all the facts I have stated. It must therefore be my desire to prove them in a legal way, and to that effect I should, at once, proceed against Prof. Petzval in Vienna, but having been informed by my attorney there of the impossibility of this proceeding on account of Prof. Petzval not having attacked me in Vienna, I must adopt such measures as to force him to proceed against me, and it is with this particular view that I publicly denounce him to be a LIAR and CALUMNIATOR, in PARTICULAR reference to his denials of my having received from him the document referred to and, therefore, of my having known the lens in question, in which points I have proved, that he has been lying and calumniating. I think I have left to Prof. Petzval, in order to ward off this insult, no alternative but proceeding against me, which I shall expect him to do in Brunswick. Should he content himself only with writing letters in the style of his former ones, instead of clearing himself of my charge, any honorable man will be able to draw his conclusions upon such proceeding and must shrink from coming into contact with a man, *who puts up with such an insult*. Being much afraid, that, in spite of all this, Prof. Petzval will *not* proceed against me, but rather try to screen himself behind some pretence or other, such perhaps, as he alleged viz., that the dispensation of justice in cases of intellectual property is very expensive, *my purse is offered to him*, inasmuch as *I pledge herewith my word to pay all the expenses* of his law-suit against me in case he should be able to prove *that I am not in possession of that document.*

The conduct of Prof. Petzval is so very strange that many a man raises with me the question how he will escape the public censure, when in case of a law suit, the document will be produced against him, *as well as in case he should avoid proceeding against me*, as I have challenged him to do. *Should he dare to disown his hand-writing the document not being signed?* For that event my measures are already taken, that paper having been presented only a short time ago, to some persons of high scientific standing in Vienna, who have *recognized it as written by Prof. Petzval*, and who have engaged their promise to certify in case of necessity this recognition upon oath. The only answer to this query is that Prof. Petzval knows he only runs the risk of being regarded by some persons more in the light, in which he already appears to those, who know his transaction with Mr. Waibel, his controversy with Prof. Spitzer, and his conduct towards me. He is much like a man who has nothing more to lose, but in staking all on one card, is playing "va-banque," his sole object being to suppress, by any means, my competition. In England some comments have already transpired against me, some persons not having found it credible that an optician like me should have known such a lens for so long a time; the authority of Prof. Petzval has been considered of sufficient weight against me, and so on. I allow that appearances were against me, and must find it excusable that many a man could not suppose Prof. Petzval, in his position, acting in such a manner towards me; yet I cannot conceal that these comments have been to me a source of deep and bitter mortification, considering my social position and the perfect justice of my cause. I have however, the satisfaction that already one of those gentlemen, who had commented against me, after having seen my first answer to Prof. Petzval's letter, expressed in a private letter, his regret at having hurt my feelings, and I hope that *now, as all the facts are known*, the public cannot waver in whose favor to pronounce the verdict. I deeply regret to have been obliged to divulge to the public the private character of a man, to whom the photographic world is certainly much indebted, but no other alternative was left to me, my honor having been at stake. Whatever may be the merits of my adversary, every man of honor must feel with me that these cannot entitle him to have acted in so *mean* and *despicable* a manner towards me.

VOIGTLANDER.

Brunswick, November, 1858.

ON THE THEORY OF THE DAGUERREOTYPE.

To the Editor of Photographic Notes.

DEAR SIR,—In the article "Daguerreotype," of your *Photographic Dictionary*, I find the following passage:—"The theory of this process is so exceedingly obscure *and uncertain* that at present any attempt at explanation of it must involve much that is hypothetical. The sensitive film is supposed to be at first in an amorphous state, but to be chrystallized and roughened by the action of light. The mercurial vapour adheres to this roughened surface and forms the lights of the picture by amalgamating with the silver. The iodine and bromine are removed by the hypo-sulphite of soda.........................Such appears to be the theory of this very beautiful process."

Perhaps I might fairly conclude from the above passages, that the explanation which I gave some fifteen years ago of the formation of the Daguerrean image has not found more favour in your eyes than it did in those of "M. Daguerre" himself; but I would rather believe that the three papers which I presented to the "Academy of Sciences" on that subject, buried as they are in the voluminous *Comptes Rendus* of that learned Society, have not come beneath your notice. No facts which have since come to my knowledge, have awakened any misgivings in my mind, as to the soundness of my views. They have explained for me all known phenomena, and they have suggested new fields of experimental research; and I have some hope that I shall make you a convert to a theory, which is at least as plain, as simple, and as elementary, as the theory to which you allude is obscure, abstruse and transcendendal.

The following are the simple facts on which my theory relies:

1. When a piece of pure metallic silver is exposed to the action of an atmosphere containing iodine in solution, the surface of the metal is tarnished or encrusted by what might be designated, by analogy, as an iodide rust. This rust, porous, amorphous, and of pale yellow colour, absorbs and retains a certain amount of atmospheric air, of aqueous vapour, and of pure uncombined iodine.

2. When pure amorphous iodide of silver is exposed to the action of mercurial vapour, the latter is absorbed, and the double affinity of the mercury, both for iodine and silver overcomes the affinity by which these two elements are bound together; and an iodide of mercury and a silver amalgam are formed. But, when the iodide of silver retains mechanically pure and uncombined iodine in excess, iodide of mercury is formed by the direct action of the iodine; and between these two Haloids, iodide of mercury and iodide of silver, no further reaction can take place.

3. All halogene elements are alike characterized by an affinity, more or less strongly marked, for hydrogen, and a consequent tendency to form hydracids at the expense of any organic substance or any hydrogenated compound with which they may be brought into contact. It would appear however that this tendency to combine with hydrogen cannot result in actual combination without the presence of light; and the quantity of hydracid formed is *ceteres paribus* proportional to the intensity of the light and the duration of its action. In this respect however the halogene substances with which the photographer is most concerned, iodine, bromine, and chlorine, differ widely one from the other. The affinity of iodine for hydrogen is weak: the combination can only take place under the influence of the most refrangible rays of the spectrum, those situated below the double band F of Frauenhöfer: the hydracid formed is unstable; and it is said that it may be again resolved into its component elements of iodine and hydrogen, under the influence of the least refrangible rays. The affinities of bromine and chlorine for hydrogen are far more strongly marked: the combination takes place, though with widely differing intensity, under the impact of all the different rays, and the acids formed are stable.

Again, the nature of the organic compound, with which the halogene element is brought into contact, appears to be of some importance: thus, iodine dissolves slowly in alcohol, and the formation of iodhydric acid is gradual in the extreme; in essence of turpentine or essential oil of lavender, the rapidity of the combination amounts to explosion; whilst, on the other hand, if a few drops of bromine are poured into a small quantity of alcohol the formation of the bromhydric acid is so violent as to project the liquid in all directions and seriously to endanger the eyesight of the experimentalist.

These are the leading facts on which my theory of the formation of the Daguerrean image is founded. I have purposely refrained from offering any illustrations, as your readers will find them at every page of your Photographic Dictionary. Let us now see how they can be made available for my purpose.

Besides its more generally known constituents, oxygen, nitrogen, carbonic acid and aqueous vapor, our atmosphere contains another element, towards which the investigations of science have been as yet but partially directed. I allude to that organic matter, which, poured forth into the atmosphere under the form of a volatile or essential oil, from the respiratory organs and the skins of animals, from the leaves and petals of plants, and from vegetable and animal matter in every stage of decomposition, is there more completely oxidized, and is again thrown down under the form of a wax or resin on all the surfaces which are freely exposed to the action of the air, and to which it forms a protecting varnish. In our domestic economy this organic matter is but too familiar to us: it dims the transparency of our window panes, deadens the lustre of our mirrors, and tarnishes the brilliancy of all the polished surfaces on which it is deposited. Physiologists and Sanitarians are seeking in it the vehicle by which epidemic and infectious diseases are wafted about and propagated, and by them its nature and properties have already been submitted to investigation and analysis; and physicists, we have no doubt, will some day find in this same natural varnish an easy explanation of many anomalous phenomena: thus, the images of Moser, attributed by him to the somewhat obscure agency of *invisible light*, were shewn by M. Fizeau to depend on the transfer of this organic matter from one surface to another.

The adhesion, or the non-adhesion of the deposited metal on the cathode or mould, an uncertainty of no small importance to electrotypists,—the unequal action of acids used in etching upon metallic surfaces;—the disposition of metallic surfaces themselves now to retain, and now to repel liquids, and the singular optical phenomena they present when the breath is condensed upon them; these and many other as yet imperfectly explained phenomena will perhaps some day find an easy explanation in the presence or absence, the composition, the thickness, and the unequal distribution of this same atmospheric varnish. Rather must it be believed that this varnish can be removed by the chemical agency of dilute acids, or by the mere abrasion of the polishing pads. The abstract surface of the geometrician "length and breadth without thickness" is not the surface with which the physicist or the photographer has to deal. Our surfaces, be they of metal, glass, or porcelain, must all be considered as thin layers or strata of a more or less porous substance in which this organic matter is absorbed, and from which it can be removed only by incineration or carbonization: incineration, if the surface be heated to a temperature of 500° over a spirit-lamp or a charcoal brazier: carbonization, when a saturated solution of caustic potash is boiled, evaporated to degrees, and the residue fused on the surface.

There is reason to believe that the existence and properties of this substance were not unknown to the modest and sagacious "Niepce", to whose great merits as originator and founder of the heliographic art in all its branches, a due meed of praise has never yet been awarded. Indeed I have been informed that the accidental observation of an effect attributed by him to this cause first drew his attention to the action of light on thin organic films extended on highly polished surfaces. Be this as it may, however, it is certain that M. Daguerre, whom Niepce, during his lifetime, had initiated into all his secrets, and to whom at his death he entrusted his papers, was perfectly aware of the existence of this element in the atmosphere, and of its inevitable presence in the sensitive coating of his silver plates; but he appears totally to have misapprehended the very important part which it there performs; at least, he strongly repudiated the idea that the formation of the Daguerrean image could in anywise be attributed to the action of light on organic matter. Perhaps this was in Daguerre the result of scientific conviction: perhaps he was unwilling to admit that the admirable process which he named and claimed as exclusively his own, was in reality bound by so strong a link of affinity to those earlier and far inferior processes which he had received from his friend and master.

M. Daguerre has never told the world by what steps he was led to his marvellous discovery, and we can only conjecture the clue by which a man, so strangely ignorant of the first rudiments of chemistry and physics, was guided through the intricate mazes of these most delicate reactions.

A highly-polished Daguerreotype plate then must be considered as a thin layer of silver, amorphous, and eminently porous, on which the atmosphere has deposited an organic substance which the pores of the metal have absorbed and which the action of the polishing pad has extended in a thin, even, continuous, homogeneous and transparent film, over the surface of the metal. The dilute acids can but have removed the soluble metallic particles; and the velvet buffers, loaded with powdered charcoal, must have added to, rather than taken from, the organic coating of the plate, for, it must be remembered, that vegetable charcoal is the most powerful absorbent of atmospheric organic matter which we possess. When the plate thus prepared, is exposed to the action of iodine, the organic film becomes rapidly impregnated with its vapor, whilst the surface of the underlying silver is transformed into a layer of iodide, each molecule of which is, as it were, surrounded by an atmosphere of uncombined iodine. The action of the

light on the film thus iodized is simple in the extreme: it transforms the iodine into an hydracid at the expense of the organic matter, in which it is dissolved; whilst the iodhydric acid thus formed takes up the uncombined iodine of the mineral layer beneath. Thus the image formed by the lens is permanently impressed on the sensitive film, the shadows being represented by pure iodhydric acid, and the quantity of acid formed being exactly proportional to the local intensity of the light.

The metallic vapor which ascends from the heated surface of the mercury bath is condensed by the colder surface of the silver plate into minute globules; and these, penetrating the outward or organic film, are brought into contact with the iodide of silver beneath; wherever that iodide still retains uncombined iodine the contact is but mediate and indirect; for the metallic globules are at once encrusted with a coating of iodide which interposes between the mercury and the iodide of silver, and at once arrests all future chemical action: but, wherever the iodide of silver has been denuded by the impact of light of its protecting atmosphere of iodine, the contact of the metallic globules with the iodide is direct and immediate; and the twofold affinity of the mercury is called into action: the iodide of silver yields up its iodine to the mercury, and the formation of iodide of mercury, and the amalgamation of the reduced silver are the result. Finally, the solution of hypo-sulphite of soda dissolves out of the sensitive film both the uncombined iodine and the haloids of silver and mercury, and nothing is left on the surface of the plate but an unaltered varnish in the blacks, and, in the lights, altered organic matter, reduced silver, and silver amalgam. This is the Daguerrean image.

The familiar process of soldering or tinning copper offers a simple illustration of these chemical reactions. If you place a small piece of tin on a clean and bright copper plate and heat the plate in the flame of a spirit lamp, as the temperature rises a thin iridescent film of cupric oxyide, will be formed, which will expand in concentric rings over the surface of the plate. When the melting point of tin is attained, that metal will assume the liquid form, but instead of flowing like a liquid over the surface of the copper, it will gather itself up in globules, as though repelled, and constrained to limit its contact with the underlying metal to a single point. Now let a few grains of powdered resin, be sprinkled over the two metals: the cupric oxide will at once be reduced by the deoxydizing agency of the organic matter, and, in an instant, the globule of tin will spread itself out like a liquid which has burst the pouch which contained it—and the *tinning* process is complete. But if, before exposing the plateofcopper to the action of heat its surface has been melted with a weak solution of chloride of ammonia, the oxide of copper would be replaced by a chloride of the same metal. In this case, as soon as the tin assumes the liquid form, the twofold affinity of that metal for chlorine and copper will be called into play. The copper will yield its chlorine to the tin and the tin will at once combine with the reduced metal.

I need hardly point out the analogy which exists between these reactions and the origin which I have ventured to assign to the Daguerrean image. It must not however be concluded from that analogy that I consider the presence of organic matter as absolutely indispensable. Such is not the case. As a matter of fact, organic matter is always present, in the sensitive film; but, it must be remembered that, even if it were possible to free the surface of the silver from all foreign matter, and to expose it, chemically pure, to the action of iodine the iodide of silver thus formed would still retain both aqueous vapour, and uncombined iodine; and that aqueous vapour, however small its quantity, would afford an ample supply of hydrogen for the required reaction, so large is the equivalent of iodine (126), as compared to that of hydrogen (1), I shall perhaps at some future time have occasion to shew that one-hundred-thousandth part of a grain of aqueous vapour would suffice for the formation of the Daguerrean image over a surface of twelve square inches. But if organic matter is not *essential* to the formation of the image, it tends, at least, greatly to its perfection: for, to the combination of organic matter with the reduced silver or the silver amalgam, is due that purple tint which so greatly enhances the beauty of the whites: whilst its action, as a simple mechanical screen in the blacks of the image, prevents the condensed globules of mercury from accumulating on the iodide of silver, and thus overpowering the feeble obstacle which the iodide of mercury opposes to the affinities of that metal. That such is the twofold action of the organic matter is clearly shewn by those proofs in which effective means have been taken to reduce that element to a minimum: the image is still formed as usual, but the lights are faint, meagre, shadowy and lead-colored, whilst the blacks, after a slight exposure to the mercury, become blanched and apparently dusted over by a grey powder which totally destroys their lustre and transparency.

It is possible that some other agency besides those which I have pointed out may contribute in some measure to the final result, thus: as silver is an eminently porous metal it may be presumed that the silver plate itself exercises on the iodide of silver and the mercury a catalytic action which calls into play their mutual affinities, as a plate of platinum will determine, even in the dark, the combination of hydrogen with chlorine which has been previously exposed to solar light. Or it may be presumed that the molecules of iodide of silver themselves, formed as they are, beneath a superincumbent layer of varnish, are retained in a non-natural axial position, from which they are freed only by the partial disintegration of that varnish by the action of light, and are thus rendered more amenable to the reducing agency of the mercury. Again it may be argued, that the mercury itself, in its passage from the metallic bath to the surface of the plate, is iodized. and that this oxide is reduced only where it is brought into contact with the hydracid formed by the action of light. These and many other purely hypothetical causes, may undoubtedly be pointed out as contributing more or less to the formation of the Daguerrean image; but, if indeed they have any real existence, their influence, I feel convinced, can only be secondary, the true explanation of that beautiful phenomenon will be found in that physical constitution of the

Daguerrean sensitive film, and those simple chemical reactions which have been described above, and which may be briefly summed thus:

1. The Daguerrean sensitive film is essentially composed of two distinct layers, an upper or outer layer of organic matter, and an under layer of iodide of silver. Both are equally impregnated with free uncombined iodine.

2. The action of light converts iodine, contained in the upper layer, into iodhydric acid at the expense of its organic matter; and the hydracid thus formed takes up an equivalent of iodine from the mineral beneath.

3. The minute globules of mercury which are condensed on the surface of the film are absorbed into it, and are thus converted into iodide of mercury, either by the free iodine which that film still retains, or, where the free iodine has been converted into an hydracid by the iodide of silver itself, the silver yielding its iodine to the stronger affinity of the mercury, becoming amalgamated, and thus constituting the lights and the half-tints of the image.

I am fully aware how unavailing such an exposition must be to carry conviction to the mind of the reader, unaccompanied as it is by any of the collateral circumstances which alone would give it weight, but I have been unwilling to intrude at too great a length upon the patience of your readers a subject which appears far more important to me than it probably will to them. If time and space were allowed me I could shew how all those phenomena, which may be considered as secondary in the formation of the Daguerrean image, and which the theoricians of Photography have in general passed over in mute despair, unable as they were to square them with their hypotheses, present themselves on the contrary, as the natural and self evident consequences of the constitution which I have assigned to the Daguerrean film, and the action which light exercises upon it. I here allude more especially to the action of iodine, bromine, and chlorine, in restoring the sensitive film to its integrity after it has been exposed to the action of light: to the greatly increased sensibility produced by chlorine and bromine in the iodized film: to the phenomena of hyper-bromization, commonly designated as the fog, or the veil of bromine; to the cyanization of the high lights, by once exposure improperly called the solarization of the proof: and to many other phenomena, which I need not here enumerate. But you will at once perceive that this theory suggests a *modus operandi* differing widely from that generally in use, and recommended in most treatises on this subject. The first, the most important, and the most difficult operation of the Daguerreotype process assumes an entirely different aspect: its only object is no longer to remove from a metallic surface every trace of foreign matter, so as to expose the silver chemically pure to the action of the iodine, but also, and *rather* to extend over that pure silver surface a thin and even film of well selected varnish, on whose properties, chemical, physical, and optical, the beauty of the future image will in the main depend. How this object could be attained, I endeavoured to shew in a short paper presented to the Academy of Sciences in 1843. Subsequent experience has taught me to modify in some of its details the method I then recommended though it has but the more confirmed the theory on which that method was founded. If you will allow me, I will describe minutely, in a subsequent number of the *Photographic Notes* the process which I have for some years followed. To such of your readers as may wish to make themselves masters of the most perfect, the most scientific, and the most beautiful of all photographic processes, it will, I think, commend itself for the simplicity and obvious directness of the means employed, the logical sequence of the operations, the constancy and the perfection of the results. Let them not however indulge the hope that any method can lead to unfailing success. I for one, know of no means by which unskilful, or ill-trained hands can be taught to perform, without reiterated failures, the most delicate operation of modern chemistry; and those Photographers who boast that they *never* fail would perhaps by less partial judges be thought *never* to succeed. If my own experience has taught me anything, it is, that a very small per centage of faultless proofs is all that can be looked for; and, even this result can be attained only by untiring patience, by the most fastidious attention to details the most minute, by the constant habit of scrutinizing every stage of the process by the light of its own peculiar tests, by allowing no phenomenon to pass unexplained, and lastly, by considering no explanation valid which does not place the phenomenon under the complete control of the operator —to produce or avoid it at will.

Yours, very truly,

BELFIELD LEFEVRE.

Uplands, Exeter, Nov. 21st, 1858.

POUNCY'S CARBON PROCESS.

We insert the following letter at the particular request of Mr. Pouncy. It appears that he has been playing off upon Mr. Crookes a practical joke, by adding some brickdust and flour of sulphur to the carbon, then taking a print with this mixture, smearing it over with white of egg, and passing it off successfully upon our unsuspecting contemporary for a silver print.

When the "News" was started, Mr. Pouncy was invited to become an agent, and to contribute to its columns. He has replied by palming off upon the Editor a print in brickdust for one in silver. That gentleman, after patting Mr. Pouncy encouragingly upon the back, has now turned the tables against him, and every fresh number of the "News" contains an anonymous letter against "Permanent Printing," "Carbon Printing," and the like. These occupy space in that Journal harmlessly if not amusingly, and if the readers of it are satisfied, so are we.

And now we leave Mr. Pouncy to tell his own story in his own way. [Ed. P. N.]

THE CARBON PROCESS.

To the Editor of Photographic Notes.

Dear Sir,—Having acted by your advice in making public my *practical* discoveries, and their ultimate improvement, to the Subscribers only to the Publication Fund, I have extreme pleasure in announcing to you the gratifying success which has hitherto attended this step, and the complimentary acknowledgements received from all quarters, and from the most competent authorities, certifying fully the triumph of the mode of manipulation I have propounded, as well as attesting the satisfactory nature of the results attained by it. Amongst others, H.R.H. the Prince Consort has seen, and expresses himself in the most flattering terms of the Carbon prints, through the medium of Dr. Becker; and from His Royal Highness having further honored me with his commands for materials, I have every reason to believe that it is his intention to test the process practically. Mr. Brown, a practical photographer, of Newcastle upon-Tyne, has likewise written to me, after having been afforded an opportunity of strictly investigating the details of the process and its results, amply apologising for his previous scepticism, and enthusiastically entering into the practical adoption of the process, to which he now gives his unreserved confidence. I have every reason to believe, that amongst the highly distinguished personages who intend operating practically are the Countess of Rosse, (Lady of the celebrated astronomer), and Lord Alfred Churchill.

Whilst these, and many other testimonials, not less flattering because proceeding from more strictly professional sources, continue daily, and I may say hourly, to flow in upon me, so that I can hardly supply materials fast enough to meet the demand, I must confess myself entirely puzzled to account for the conduct of the London Photographic Society, and more especially of a Mr. Crookes, who was its Secretary, as both profess to be devoted to the advancement of photographic art, and both have had unusual opportunities of attesting what my process was able to effect. Yet both have embraced every opportunity of casting doubt or even condemnation upon it, because I was not prepared, perhaps, to throw myself upon their mercy, or to make either of them the *medium* of giving my invention to the public.

1. This Mr. Crookes for example, while Secretary of the Society, professed his utter inability to decide whether my prints were Carbon or not; at the same time, that, with what I must call great dishonesty, he, although refusing to publish all that *was* said with reference to them at the meeting of the Society which I attended in London, 6th April, 1858, felt no scruple in publishing the direct falsehood, that a long discussion had taken place respecting the probable process and the chances of permanency. Need I say that I confide so entirely, even at this moment, on the good faith of the Subscribers who *alone* have obtained information regarding the practical details, that no discussion whatever is likely to be entered into of this sort; and as to the *chances* of permanency in carbon,—those only who own themselves unable to say whether carbon is carbon, like Mr. Crookes, will attempt to call *that* in question.

2. This Mr. Crookes, in his Photographic News, started after he had left the Society, seemed, at first, inclined to pursue the same obstinate and ignorant course towards me; but, in pity for the man's blindness, I wrote a letter to his paper, offering to produce before him a Carbon print by my process, and a silver print from the same negative, that he might decide for himself of what my process was capable. You, who know this well, will readily believe me when I tell you that I had no difficulty in actually deceiving Mr. Crookes for a time, (and until I chose to enlighten him), by allowing him to believe a Carbon print to be silver. Mr. Crookes did not know, and could not tell, the one from the other—literally, he mistook the carbon print for silver!

2. This Mr. Crookes behaved to me, after being thus brought to the lash, with, as I consider, still *greater* dishonesty, in not acknowledging to the world, as he had promised to do, that the effects attainable with my Carbon, were of equal delicacy and indeed not capable of being distinguished, even by authorities infallible as Mr. Crookes, from those produced by nitrate of silver. He still had the meanness, when saying anything of my prints, to affect to doubt their *being* Carbon. Of course, there is always one supposition—the most charitable construction that could be put upon such conduct—that Mr. Crookes labored under incompetency and inability to decide, that, what the *Times* of Aug. 7 had, on the authority of the *Bulletin de la Société Française de Photographie*, pronounced to be "the legitimate results of Carbon—they have resisted a long immersion in concentrated nitric or hydro-chloric acids, in aqua-regalis, in cyanide of potassium, in cyanide of potassium strengthened with iodide, and lastly, in alkaline sulphurets,—not one of which powerful agents influenced them in the least."—*were Carbon prints!* But with submission, I am much afraid that the real want of ability under which Mr. Crookes labors, is the want of ability to speak the truth!

4. This Mr. Crookes moreover has rendered himself memorable in the history of my discovery, by professing to have an original print of Mr. Fox Talbot's, some fifteen years old, which he pretended it was his intention to produce for the purpose of showing that the Talbotype, or photography in its infancy, produced results as good as the first results obtained by my process. Neither has that first print of Mr. Fox Talbot's been forthcoming, nor has Mr. Crookes had the honesty to publish my letter which I addressed to him on the subject, on receiving from the portfolio of a friend in Dorchester, where it had been as carefully as possible preserved, and describing to Mr. Crookes the now invisible condition of a print of Mr. Fox Talbot's of " Orleans on the Loire, 1843."

I would not have troubled you with these vagaries of Mr. Crookes, but that I am persuaded he means mischief, and has a fixed purpose of slandering me

and my process, although I sincerely hope I may not be under the necessity of administering to him any further castigation, which is eminently distasteful to myself. And I am happy to know, by the letter I have alluded to from Newcastle, and from others competent to judge, that those who now KNOW my process are satisfied with it. I am also glad to learn that photographers are turning their attention to the important subject of Printing in Carbon. But allow me to remind you, that up to the present time absolutely NO PRINTS HAVE BEEN PRODUCED EXCEPT BY MY PROCESS.

Yours faithfully,

JOHN POUNCY.

Dorchester, Nov. 27th, 1858.

J. Lugg, Taunton. Pyroxyline is not in its nature acid; but the rapid discoloration and deterioration of iodized collodion is frequently due in great measure to the pyroxyline not having been thoroughly washed and the whole of the free acid removed from it. Some persons wash it in warm water to which soda is added, and then thoroughly in many changes of cold water. [ED. P. N.]

W. H. S. Cyanide of potassium will reduce the densest paper negative to any extent. Use a weak solution, and that very carefully.

[ED. P. N.]

"*Virescens.*" Please send your address; we can give you better advice by private letter.

[ED. P. N.]

"*Dr. Nash.*" See the leader of this number, for a quick process. Perhaps a small positive taken with Voigtlander's quickest lens, upon a watch glass, might be enlarged: but the matter is full of difficulties to the present state of the art. Shall we insert your letter, and put the question to our readers generally?

[ED. P. N.]

☞ *The Communications of W. R. Sedgefield; "Dry Collodion;" J. L. Fysh; W. Tudor Mabley; H. H. Hele; Messrs. Matthews, Charing Cross; W. Brunton; Captain Baxter; and others, will receive attention in our next.*